Radio

WIRELESS TELEPHONE
WIRELESS TELEGRAPH
EQUIPMENT

Montgomery Ward & Co.

Satisfaction Guaranteed or Your Money Back

Chicago Fort Worth Kansas City Portland, Ore. Saint Paul

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Montgomery Ward & Co.

Special! $49.50 Complete Outfit

The Airline Special

WE are sure you will be pleased with the results you can get with the Airline Special. Comparative tests with many higher priced instruments have shown it to be one of the best sets obtainable today. Try the outfit every day for ten days. If at the end of that time you are not perfectly satisfied with the results, send it back to us and we will return to you the purchase price plus the transportation charges you have paid. Any one can easily set up this outfit with the aid of the simple instructions we include. These instructions show a picture of each part exactly as it looks with the different wires leading to the proper connections. You have an actual picture of the complete set just as it should be installed. The instructions are clear and simple. Each part is plainly marked and numbered. The operating instructions are equally plain and simple. How to "tune in" is described in such a way that you are assured of successful results the first time. With very little practice you will become expert in handling the outfit. Any member of the family may use the set and be sure of good results.

This receiving outfit will equal in results any of its type regardless of cost. Everything is complete—nothing extra to buy. You can take the materials we send you, put up the aerial wire, connect the instrument, which is easy to do, and in less than an hour you can be receiving signals, radio music, lectures, stock reports, market reports, or any other radio program being sent out within your range. This set is capable of receiving radio telephone messages for distances of 50 to 500 miles, depending on conditions.

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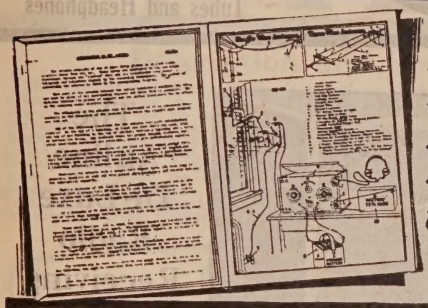
Chicago, Fort Worth, Kansas City, Portland, Ore., Saint Paul

In the Air—Waiting for You—
Entertainment, News, Education
Yours the Day You Install the Airline Special



Complete Directions for Installation and Operation Included

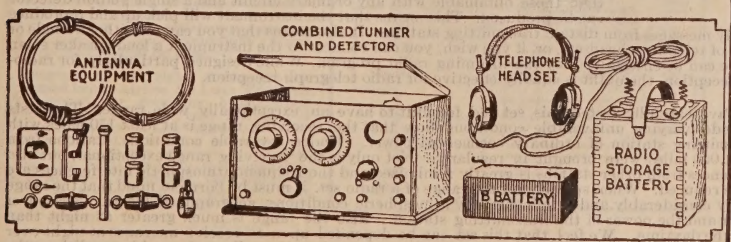
An Efficient Outfit—Proved By Tests

Many thorough tests were made with this outfit in the vicinity of Chicago. Concerts and messages being broadcasted from the sending stations in Detroit, Madison, Milwaukee and St. Louis, were heard regularly. Under favorable conditions more distant stations—Pittsburgh, Schenectady, Newark, Kansas City and Denver, were heard. We cite these instances to show what has been done with this set. Naturally, these performances cannot be duplicated at all times The effective receiving range of any set depends on atmospheric conditions, geographical location, the time of the day, season of the year, and the power of the transmitting stations. When conditions are unfavorable, even the most powerful and most sensitive receiving set will have only a very limited range, and under extreme conditions may be incapable of receiving signals entirely for a time.

This set is licensed under Armstrong Patent No. 1,113,149 for amateur and experimental use.

The Tuner and Detector

This is a single circuit type regenerative tuner requiring only very simple adjustments. The tuning circuit is directly connected to the detector and consists of a high grade condenser in series with an inductance having four taps and controlled by a switch lever This arrangement permits very fine tuning and usually will enable the operator to tune out interfering stations. Regeneration is obtained by means of a tickler coil mounted inside of the antenna inductance and wired in the plate circuit. Both condenser and tickler coil are controlled by dials mounted on a panel which makes tuning simple and rapid. Grid condenser in detector circuit. Tube socket mounted on bakelite base. Finely graduated rheostat controls filament current. Genuine bakelite panel, 6½ by 10 inches. Highly polished, mahogany finish cabinet with hinged top, 12 by 8½ by 6¾ inches. Plainly marked binding posts for all connections.



The Complete Set Includes

Airline Special Combined Tuner and Detector, which is so simple in operation that a child can handle it.

Telephone headset, our special 2,000-ohm double headset, reproduces messages loud and clear (see Page 19 for description).

Radio storage battery, 6 volt, 40 ampere (see Page 33 for complete description)

One detector tube (see Page 21).

One "B" battery (see Page 33).

Antenna equipment including 150 feet of bare copper wire, 25 feet insulated wire, porcelain base double-throw switch, lightning protector ground plate, two screw-eyes and 25 feet of wire for connecting instruments.

Shipping weight, complete outfit, 40 pounds.

663 J 639—Complete set. Not mailable..... **$49.50**
563 J 640—Tuner Detector only, without accessories. Ship. weight, 6 pounds **28.50**

Iowa "Listens In" On New York with Our Special Airline Receiving Set

How would you like to live in Clinton, Iowa, and be on "listening terms" with Schenectady, New York?

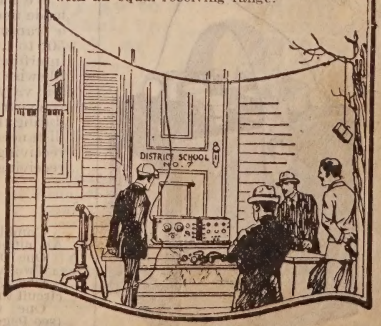
Just to see for ourselves what our Complete Receiving Outfit, Number 663 J 639, could do, we took it out to a point on the Mississippi River near Clinton, Iowa, one clear night, strung a temporary aerial up on a country schoolhouse flag pole, hitched the ground wire to the pump, set the receiving instrument on the schoolhouse steps and tuned in. We heard distinctly stations in Schenectady, New York, Detroit, Chicago, Milwaukee, Madison, Wis., Kansas City and Minneapolis.

On another clear night, with our aerial strung up on a windmill near Battle Creek, Michigan, we picked up all the stations heard from Clinton and in addition Atlanta, Ga., the Naval Air Station at Washington, D. C., and amateur telegraph stations along the New England coast.

In tests made during the daytime both in Michigan and Iowa, and from our own testing station on the roof of our Chicago building, this receiving outfit has picked up messages from stations within a radius of 140 miles. These tests were made with a single tube detector, but similar tests made with a detector and two stage amplifier amplified the messages a hundred times and brought them out so clear and distinct that with the aid of a loud speaker they could be heard many feet from the instrument.

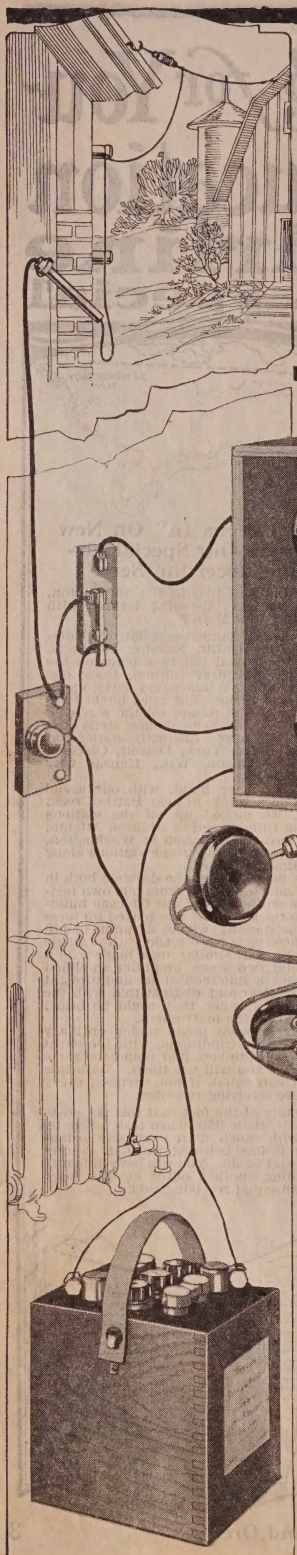
These tests were made under ordinary summer weather conditions, with the outfit just as it comes to you, and under the same conditions as you will use them. With this outfit you can equal, if not surpass, every one of these receiving records

In spite of the fact that this set costs you less than $50, when tested side by side with much more expensive instruments it has bettered them in results again and again. You will have difficulty in finding another outfit at this price with an equal receiving range.



$89.00 Tuner Detector and Two-Stage Amplifier

With Antenna Equipment, Batteries, Tubes and Headphones



The Airline De Luxe Radio Receiving Set

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

For long distance receiving and volume of tone, the Airline De Luxe will equal sets selling at much higher prices. In fact we have tested it against similar outfits sold at nearly double our price and have found the results obtained with the Airline De Luxe actually superior.

A special effort has been made to keep the instrument as simple as possible and yet incorporate the best features of the more complicated sets. The result is an outfit that is easy to handle, yet makes use of the new wonderful radio developments, such as the Armstrong regenerative circuit and vacuum tube detectors and amplifiers. With this receiver, signals more than 100 times louder than those obtainable with any ordinary circuit and a single audion detector can be produced. This means that the instrument will pick up and reproduce distinctly messages from distant transmitting stations. It also means that you can use either a single or a series of telephone headsets; or, if you wish, you can connect to the instrument a loud speaker so an audience can be entertained by the incoming radio program. While designed particularly for radio-phone reception, the outfit is equally effective for radio telegraph reception.

We have carefully tested this set and found it to have an exceptionally wide range. The tests made under varying unfavorable conditions show that the receiving range is at least 150 miles with a transmitting station of ordinary commercial power. Under favorable conditions, stations from 500 to 1,000 miles were brought in regularly. Not only is the receiving range exceptional, but also interferences from other stations is greatly minimized and the frequent atmospheric interferences are likewise reduced. When speaking of the range of a radio set, it must be borne in mind that the range will vary considerably and is influenced by atmospheric conditions, geographical location, season of the year and the power of the transmitting station. Also the range is much greater at night than during the daytime. We feel that this set can be depended upon to receive messages at night over distances varying from 500 to 1,000 miles. However, under unusually unfavorable conditions the receiving range will, of course, be reduced; just as the range of the highest powered commercial receiving stations is likewise affected.

The Complete Set Includes

Combined Tuner and Detector Two-Stage Amplifier.
One Detector Tube (see Page 21).
Two Amplifier Tubes (see Page 21).
One 45-volt "B" Battery with taps for detector circuit tube (see Page 33).
One 6-volt 40-ampere "A" Storage Battery (see Page 33).
One high grade 2000-ohm Headset with connecting cord (see Page 19).
Complete antenna equipment consisting of 150 feet of bare copper wire; 25 feet of insulating wire for connecting to the ground; one single pole, double throw switch; lightning arrester; 4 porcelain insulating knobs with screws; two aerial wire insulators; two screweyes; one porcelain wall tube, and one ground clamp.

Shipping weight, complete, 45 pounds.

663 J 638—Complete outfit..... **$89.00**

563 J 646—Tuner and Detector Two-Stage Amplifier, mounted complete in cabinet, but without tubes, headset, batteries and antenna equipment. Shipping weight, 15 pounds..... **$55.00**

Stay at Home-the Speaker or Musician may be many miles away-Yet you hear perfectly with your Airline De Luxe

Description and Specifications

The receiving instrument consists of a single tuning circuit made up of a variable condenser in series with an antenna inductance having four taps controlled by a switch lever. Regeneration is obtained by tickler coil, wired in the plate circuit. This feature greatly increases the strength of the incoming signals. From the detector, the current is passed successively through two amplifying transformers and two amplifying tubes, until it is increased in volume more than 100 times.

Genuine bakelite panel, 10¼ by 15¾ inches. Glossy black finish. Tickler coil and variable condenser controlled by two dials mounted on panel. Detector filament current controlled by vernier rheostat which gives finest control of current and greatly increases the volume of sound obtainable by enabling very close tuning. Amplifier tubes controlled by separate rheostats symmetrically arranged on panel. Tube sockets mounted on genuine bakelite base and fitted with positive contact springs. All connections are made through the rear of the set, entirely eliminating any unsightly wires. Antenna inductance and tickler coil wound with green silk covered wire; 17-plate variable condenser.

Cabinet is made especially large to accommodate "B" batteries. Connection posts plainly marked. A single filament control jack is provided. When a headset or loud speaker is plugged in, the "A" battery current is turned on automatically. When the plug is removed the current is turned off automatically, thereby economizing on the storage battery current. Fine hand rubbed, quarter sawed oak finished cabinet, 11¼ by 15¾ by 9 inches.

This set is licensed under Armstrong Patent No. 1,113,149 for amateur and experimental use.

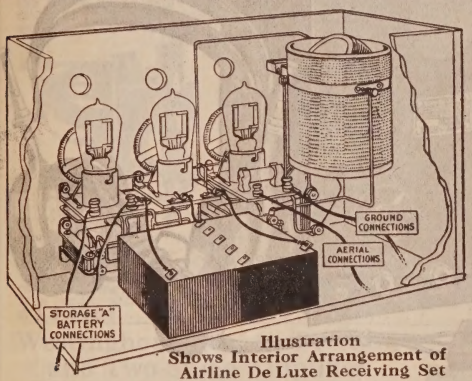
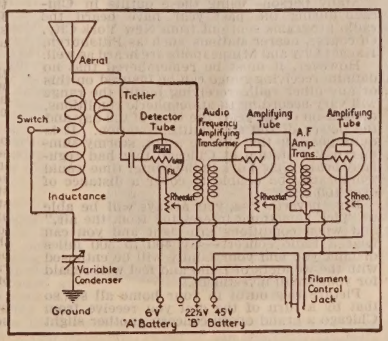


Illustration Shows Interior Arrangement of Airline De Luxe Receiving Set

The above illustration shows the interior arrangement of the Airline De Luxe Receiving Set. It shows how aerial, ground and battery wires are connected. The engineering and workmanship on this outfit is of the very best. It compares favorably with that found in the highest priced outfits on the market. All parts are arranged for greatest efficiency. The workmanship is of a quality that insures the set giving long and satisfactory service under practically any conditions where such an outfit would be used.

Diagram at the right shows the circuit used in our Airline De Luxe Receiver. This circuit for receiving broadcasting programs is one of the best known. It is easily controlled and reproduces messages loudly and distinctly. A set embodying this circuit can be easily constructed using the parts listed in this catalogue. However, we are offering this outfit at such an attractive price that but little saving could be effected by building the outfit yourself.



Attach a Loud Speaker to Your Airline De Luxe

Receiving set as listed does not include a loud speaker. Refer to Page 18 for complete descriptions of loud speakers. Any of those shown give satisfactory results with this set.

In our tests we have found that when this set is connected up with the sounding chamber of any good grade phonograph, when using our special loud speaker unit or the Baldwin Type "C" Loud Speaker unit, as described on Page 18, most excellent results were obtained. The concerts broadcasted from Chicago, Detroit and Schenectady were brought in very clearly and provided excellent entertainment. We found also that this set, when connected to a phonograph, using the regular headset supplied, which was attached by means of our adapter number 63 J 658, gave excellent results. If no phonograph is available, any of the amplifying horns listed can be used and the tones produced will be very plain and clear. For theatres, large halls and assemblies we recommend a Magnavox. This instrument produces sound in any volume required. When standing close to the Magnavox the tones are not as pleasing as those produced by the phonograph, but at a greater distance the reproduction is realistic and satisfactory.

The Entire Family Will Enjoy a Radio Receiving Set

RADIO is the game the whole family can play together. Evening after evening, Dad with his pipe, Mother with her sewing, old and young, big and little, hovering happily over the "tuner;" brothers, sisters, babies, grandparents—every member of the family will gather around the home hearth to enjoy together the entertainment that comes to them with their radio outfit.

Broadcasting stations are now covering the entire country with programs of news, stories, music, lectures, sermons—different every evening—something to interest people of every age. Little folks delight in the stories; middle aged folks sing, dance and play games to the music, while the grownups also enjoy the varied program. The entire family may go to school, to church, or to opera—together, by its own fireside, with radio.

Almost every day ushers in some new form of radio entertainment that will make your outfit even more enjoyable. Your radio set will grow more fascinating every day you own it, and will bring countless new interests and new ideas to every member of the family. Boys and girls will profit by the advantages, and the fun, that a radio outfit brings to them.

Westinghouse "R. C." Radio Receiving Set

THE most satisfactory, medium priced, long distance Radio Receiving Set, and at the same time the simplest to operate, is the Westinghouse "R. C." This receiver is manufactured by the Westinghouse Electric & Manufacturing Company, whose reputation for high grade electrical appliances is well known. The "R. C." receiver will give results equal to any receiver on the market today; it has none of the complicated, intricate adjustments so often found in the higher priced types of receivers which require trained radio operators to handle. The "R. C." receiver is so simple that a beginner may secure perfect results with it.

Either a telephone receiver headset can be used to hear the signals, or a loud "speaker" may be connected so that a room full of people may be entertained. In fact, the messages may be so amplified with certain types of loud "speakers" that they may be heard at a distance of 100 feet or more.

The Westinghouse "R. C." outfit, properly installed, has a very long range for radiophone broadcasting reception. It combines the Armstrong regenerative circuit with detector and two-stage amplifier. Makes a very sensitive receiver that will regularly "bring in" distant stations

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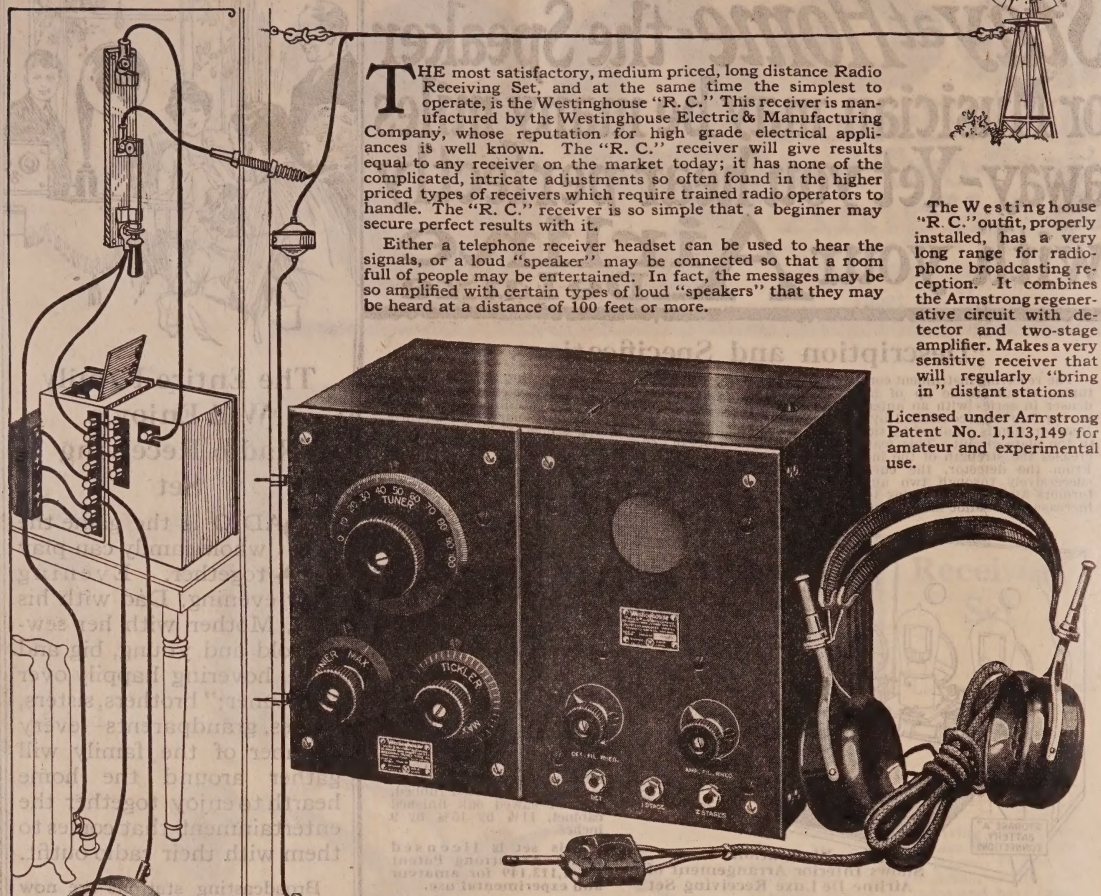


Many persons using these outfits in Chicago during the past year have heard the radio programs sent out from New York City. Of course, nearer stations such as Pittsburgh, Kansas City and Minneapolis are heard as well.

However, it must be remembered that no definite receiving range can be insured on this or any other radio receiving outfit; the range will vary according to atmospheric conditions, the season of the year, the time of the day and the power of the transmitting station. It is quite possible that during a hot, stormy summer day a station at Chicago that had regularly heard New York in the winter time would temporarily be unable to cover a distance of over 100 miles.

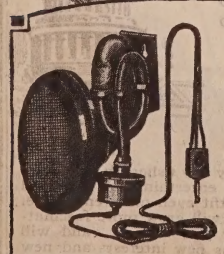
But, nevertheless, you always will be able to "pick something interesting from the air," and when conditions are right and you can hear a radio concert—say 400 to 500 miles distant, you and your family will be enthused with the wonders of radio and feel well repaid for your small investment.

Picture this outfit in your home all set so that by a turn of the dial you receive from Chicago a grand opera concert; another slight turn and you tune out Chicago and tune in the Detroit Symphony Orchestra concert; again a slight movement of the dial tunes out Detroit and you hear a lecture from Pittsburgh.

Right in your own home in the evening after the day's work is over, with just a short aerial wire outside the house, messages and concerts are picked out of the air—no wire or other connection to any other place.

Not only are the things mentioned sent out by radio, but market reports, stock reports, sermons, speeches, latest news items and other interesting programs are broadcasted regularly so that all within range of the transmitting station can hear. Dozens of new broadcasting stations are either being built or are in preparation. Within a short time stations will be located at comparatively short distances throughout the country. This means that anyone can always get at least one station by radio, and under favorable conditions any one of a dozen or more can be heard.

With such an outfit as this, each station can be tuned in separately and the others tuned out so they will not interfere.



Vocarola Loud Speaker

As stated above, the "R. C." set can be used with a loud speaker to entertain a room full of people, but no loud speaker is included in the outfit. Vocarola is the most satisfactory to use with this set. For entertaining larger audiences we recommend the Magnavox. See Page 18 for Loud Speakers.

The Complete Outfit Consists of

The Westinghouse "R. C." Set—which is fully described on opposite page.
One Baldwin Type C Double Headset with universal jack plug. (See Page 19, Article Number 63 J 5164 for description.)
One Radio Storage Battery, 6-volt 80-ampere hour capacity.
One Radiotron Detector Tube and two Radiotron Amplifier Tubes.
One combination 45-volt "B" Battery with 22½-volt tap for the detector circuit.
A complete antenna equipment consisting of:

150 feet stranded aerial wire cable.
2 air-gap type, extra high grade aerial wire insulators.
1 extra high grade wall insulator (see Page 35).
1 600-volt 100-ampere radio grounding switch; 25 feet No. 4 insulated ground wire.
1 lightning arrester.
1 porcelain base switch.
8 large porcelain insulating knobs with screws.
2 screweyes.
1 ground clamp.
50 feet rubber covered connecting wire.
15 feet flexible cord to connect batteries to instruments, etc.

Shipping weight, complete, 50 pounds.

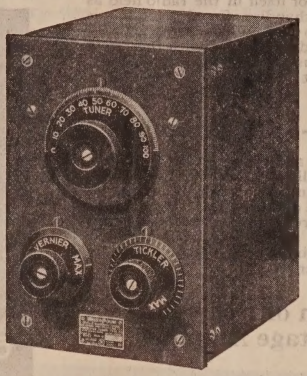
663 J 621—Complete outfit, with instructions for installation and operation **$169.00**

Westinghouse D. A. and R. A. Radio Instruments

These two instruments, combined in one cabinet, make up the R. C. set shown on opposite page. They are supplied separately so that either can be used with radio instruments of other makes if desired.

Type R. A. Short Wave Regenerative Tuner

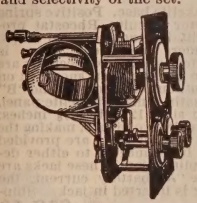
Licensed Under Armstrong Patent No. 1,113,149 for amateur and experimental use.



This instrument takes the incoming radio wave collected on the antenna wire and "tunes" it so the other apparatus used can change the wave so it may be heard in the head receivers. In order that this "tuning" can be done easily by anyone, the instrument is made as simple as possible and requires but one adjustment in order to tune to the desired signal. The wave length range is from 180 to 700 meters, which means that amateur, broadcasted and commercial messages may be tuned in. May be used with a crystal or an audion detector, working alone or in conjunction with an amplifier.

How It Works

This is a single circuit tuner and the oscillating circuit consists of a condenser of variable capacity and a variometer inductance connected in series. The rotating plates of the condenser and the rotating coils of the variometer are mounted on the same shaft (controlled by the large dial), and are so balanced that rotating the one shaft changes simultaneously the inductance and capacity of the antenna circuit, thereby keeping the efficiency of the oscillating circuit practically constant throughout the entire range of the receiver. A single plate variable vernier condenser (controlled by lower left hand dial) is connected in parallel with the main condenser, and makes extremely fine tuning possible. Through the use of an adjustable tickler coil (controlled by the lower right hand dial), regenerative amplification may be obtained with a vacuum tube detector. This greatly increases sensitiveness and selectivity of the set.



Details of Construction

All connections are made at the back of the cabinet. Binding posts extend through the rear of the tuner and they are plainly marked by machine engraved insulating plates. The capacity effect of the operator's body on tuning is eliminated by means of a metal shield mounted on the back of the front panel, and connected to the ground circuit.

Panel—Micarta, dull satin finish. **Cabinet**—Height, 9½ inches; depth, 8½ inches; width, 6½ inches. Solid mahogany, varnished and polished. **Dials**—polished black Micarta with beveled edges. Markings filled in white. **Condensers**—Rotary plate type, air dielectric. **Wiring diagram** showing all connections is included, together with complete instructions for installing and operating. Net weight, 6 pounds. Shipping weight, 10 pounds.

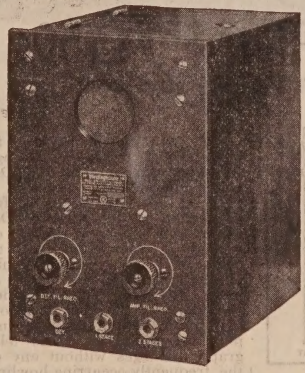
563 J 622 ..... **$68.00**

Load Coil for Use with Type R. C. Receiver or R. A. Tuner

The addition of this coil to either the R. C. or R. A. instruments, increases the receiving range, making possible the reception of signals having wavelengths from 1600 to 2800 meters. It is readily attached to two binding posts at the rear of the cabinet. Ship. wt., 1 lb.

63 J 6301 ..... **$6.00**

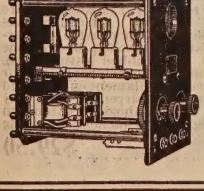
Westinghouse D. A. Detector and Two-Stage Amplifier



This instrument can be used in conjunction with any type of tuner—loose coupler, honeycomb coils or regenerative tuner. It provides a vacuum tube detector and two stages of audio frequency amplification. The results obtained with it are vastly superior to the results obtained by a crystal detector under the same conditions, the signals as given out by the second stage of amplification being at least one hundred times louder than on a crystal detector. It is this type of instrument, used in connection with a regenerative tuner such as the R. A. set listed above, that makes possible the wonderful results obtained by modern radio. Two such instruments working together have received radio telephone messages from stations 1000 or more miles distant. (See description on opposite page.)

How It Works

The current is first passed to the detector tube, from which it passes on to an amplification transformer, which steps up the current and delivers it to the first amplifying tube. The incoming messages at this point already are greatly increased, but are further amplified by passing through another amplifying transformer, from whence the current is delivered to a second amplifying tube, and the current when delivered from this tube has been stepped up so loud and clear that messages even from far distant stations can be heard very distinctly, either in the telephone headsets or through the loud speaker. Two rheostats—one controlling the detector tube, the other controlling the two amplifier tubes—give perfect control of the filament currents. Three telephone jacks mounted on the panel enable the signal to be heard either by the detector or first or second stage of amplification by inserting the plug in the corresponding jack. All binding posts are located at the rear of this instrument, and are so arranged that direct wiring connections can be made with the R. A. tuner. The three sockets for holding any standard vacuum tube are mounted on a shockproof shelf which absorbs vibrations that otherwise would be transmitted to the tubes and introduce undesirable noises.



Panel—Micarta, dull satin finish.

The cabinet is 9½ inches high, 8½ inches deep and 6½ inches wide, solid mahogany, varnished and polished. The instrument is completely shielded on all sides, entirely eliminating capacity effects from operator's body.

Wiring diagram showing all connections is included, together with complete instructions for installation and operation.

No batteries, tubes or headphones included. Net weight, 10 pounds. Shipping weight, 13 pounds.

563 J 624 ..... **$70.00**

Follow the Big Games by Radio

Only a few thousand actually will see the games, but millions will sit in grandstand seats in their own homes, and with their radios "tuned in," listen for the good word that Ruth or Hornsby or Walker has "clouted 'em" into the championship.

Last year, for the first time in history, fans miles from the scene of the battle "watched" the game, play by play, as it came to them over the wireless telephone.

This year you who own radio outfits are in the midst of the world of sports no matter where you live. Broadcasting stations all over the country will relay to you the news of the games. Not only baseball, but football, basket ball, polo, hockey, golf—all the sporting news is yours first hand.

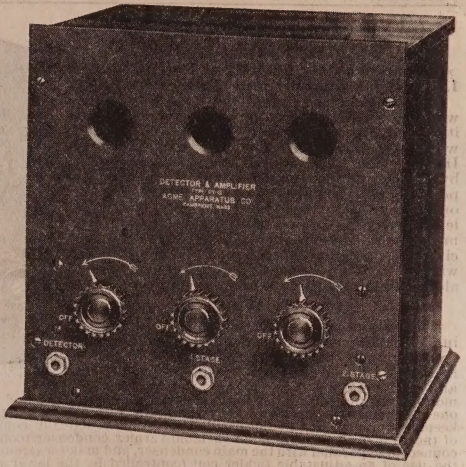
A radio outfit keeps you "in step"—it gives you a grandstand seat for the biggest sporting events of the season, the country over.

Acme Apparatus $39.50

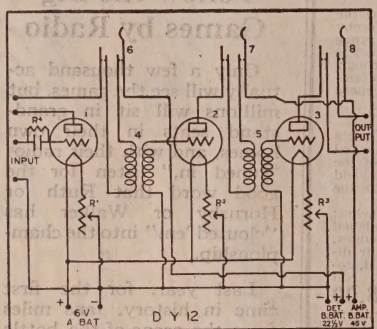
ACME Apparatus has made a place for itself in the radio field as being equal to the best quality merchandise offered. Not only is it of excellent quality, but the radio circuits have been carefully designed and durably constructed. Coupled with these two points, Acme Apparatus is offered by us at very reasonable prices. It represents what we consider the best value of any advertised brands on the market.

Acme Detector and Two-Stage Amplifier

A superior instrument. Consists of an audion detector to which is added two stages of audio frequency amplification. The circuit used is one of the best and insures maximum amplification without distortion and without the objectionable noises and howling. High grade materials are used throughout. The instrument is exceptionally well finished and presents a neat, handsome appearance. Can be used with any tuner employing any ordinary circuit, and is arranged to be directly connected to any regenerative tuner.



Circuit Diagram of the Acme Detector Two-Stage Amplifier



This diagram shows the circuit used in the Acme Detector Two-Stage Amplifier, one of the best circuits known, and insures excellent results when a good grade of audio frequency transformer is used. The construction of an instrument of this kind is comparatively easy. You will find that you can make a high grade instrument with the materials listed in this catalogue.

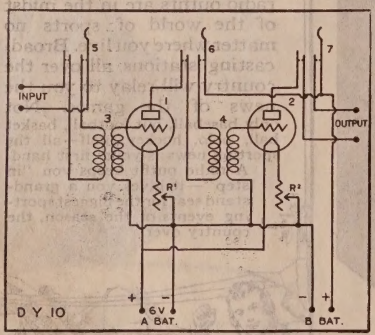
Details

High grade sockets mounted on bakelite base. Positive spring contacts. Grid condenser in detector circuit. Rheostat provided for control of filament circuit in finely divided steps. Acme Audio Frequency Transformers are used. Space is provided in the cabinet for "B" batteries. All connections are made at the rear of the cabinet. Ten binding posts mounted on bakelite strip are provided for input, output, and "A" and "B" batteries connection. Oil rubbed satin finish, bakelite panel, in brown hand rubbed finish; base size, 12¼ by 9⅛ inches; height, 10½ inches. Top is attached with two hinges, making the interior easily accessible. Filament control jacks are provided so that phone or loud speaker can be connected to either detector, or first or second stage of amplification. These jacks are very desirable as they economize the "A" battery current, the current being drawn only when plug is inserted in jack. Shipping weight, 12 pounds.

563 J 643 ..... **$39.50**

Acme Two-Stage Amplifier

$29.50

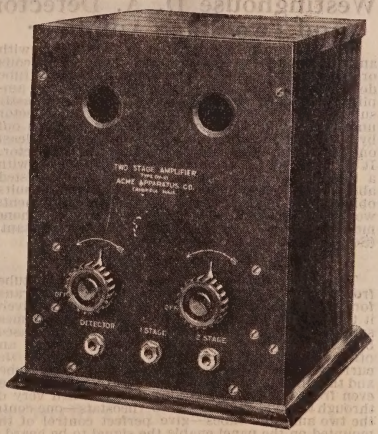


Circuit Diagram of the Acme Two-Stage Amplifier

This diagram shows the circuit used in the Acme Two-Stage Amplifier. Gives excellent results when used with either audion or crystal detector. An instrument of this kind is easy to construct and can be made at a surprisingly low cost with the articles listed in this catalogue. If you already have a tuner with a detector, either crystal or audion, you will find that you can greatly increase the usefulness of your set by adding to it two stages of audio frequency amplification. You can bring in signals you never heard before, and radio concerts can be amplified enough so they can be heard all over an ordinary size room with any loud speaker.

This Amplifier is the same as the above Detector Two-Stage Amplifier, except that the Detector unit has been omitted.

It is especially designed for connection to any style of Detector unit, either audion or crystal. It will take the signals as delivered by the Detector unit, and increase them in volume at least 100 times. This Amplifier is designed to give the best possible radio results and will amplify radiophone or radio telegraph messages without any of the frequently occurring howling and induction noises which are so objectionable.



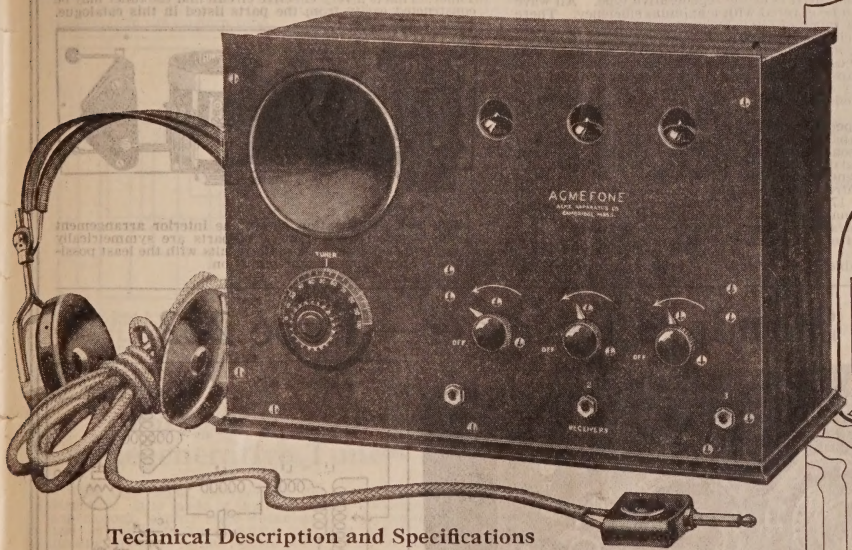
Description of the Acme Two-Stage Amplifier

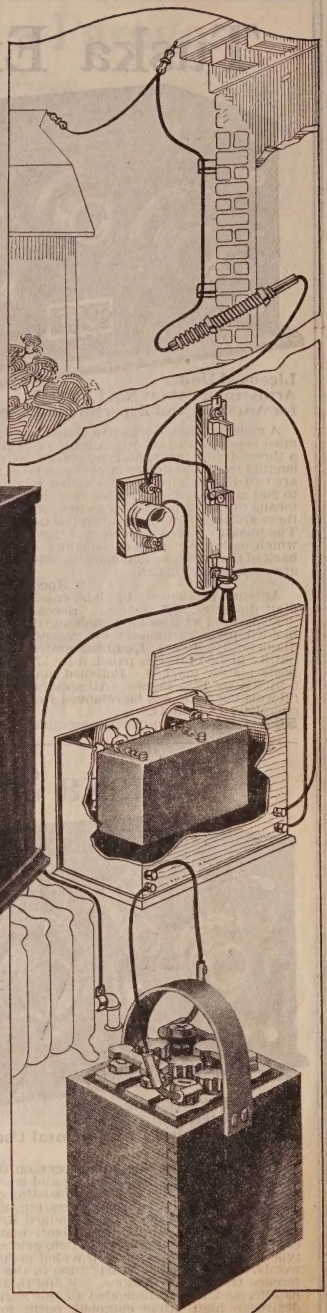
Sockets mounted on bakelite base; positive spring connections. Filament current controlled by durable, positive acting rheostats. Acme Audio Frequency Transformers are used. Ample space is provided inside the cabinet for the "B" battery. All connections are from the rear. Eight binding posts mounted on bakelite strip provide connections for input, "A" and "B" batteries and output. Rheostat controlled by genuine bakelite knobs with corrugated edges for secure finger grip. Oil rubbed satin finish, bakelite panel 8 by 10 inches. Jacks are provided for connection to external detector and first or second stages of amplification. Amplifier jacks control filament current and insure maximum economy in the use of the "A" battery current, as current is used only when plug is inserted in jack. Elegantly finished, genuine solid mahogany cabinet in brown hand rubbed finish. Base size, 9¾ by 9⅛ inches; height, 10½ inches. Shipping weight, 8 pounds.

563 J 644 ..... **$29.50**

Acmefone Loud Speaking Radio Receiving Set

THIS receiver is fitted with a loud speaking device built right into the cabinet, which reproduces radio messages so that they can be distinctly heard in any part of a room of ordinary size. This special feature makes this an excellent outfit to entertain small audiences in the home, club, church or hall. Without any other attachments you can get music, lectures, news items, reports of sporting events, market reports, etc., from any transmitting station within the range of the instrument, which ordinarily is from 50 to 75 miles. However, we wish to make clear the fact that this instrument does not have as broad a range as some of the other types of instruments, such as the Westinghouse R. C. and combination R. A. and D. A. sets, or our Airline instruments. While we consider that this instrument will work satisfactorily at a range of from 50 to 75 miles and even farther, it must be understood that no definite receiving range can be stated on any radio receiving set—as geographical location, atmospheric conditions, the season of the year, the time of day and the power of the transmitting station entirely determine the receiving range. However, if you live nearby a transmitting station you will find this a very complete and satisfactory instrument. The control is so simple that a child can get excellent results.

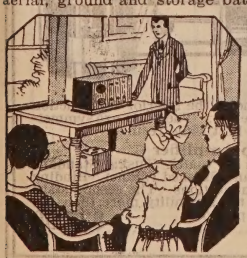




Technical Description and Specifications

To operate the Acmefone the three small knobs which control the "tubes" are turned clockwise until the tubes light up. After that all adjusting is done by means of the dial located beneath the loud speaker opening. This dial is simply rotated back and forth until the message wanted is plainly heard. The volume of sound may be easily controlled so that the music, speech, etc., comes through the speaking horn loud enough to be distinctly heard by everyone in the room.

The receiver has a single tuning circuit, with a variable condenser in series with an antenna inductance. This circuit is directly connected to the detector circuit, to which is added two stages of amplification. The best grade tube sockets are used, and the transformers are the Acme make, which are recognized as among the most efficient. The loud speaker is connected to the second stage of amplification and has for its working unit a special scientifically designed amplifying unit directly connected to a sounding horn which is very carefully worked out to give clear, pure tones. Provision is made to mount the "B" battery inside of the cabinet, so that the external connections are those that lead to the aerial, ground and storage battery. Genuine mahogany cabinet, size 8½ by 16 by 11¼ inches. Satin finish, machine engraved formica panel. Jacks are provided in the detector, first and second amplifier circuits, so that any standard telephone headset can be plugged in either one of the three circuits; and when a receiver is in circuit the loud speaker is automatically disconnected

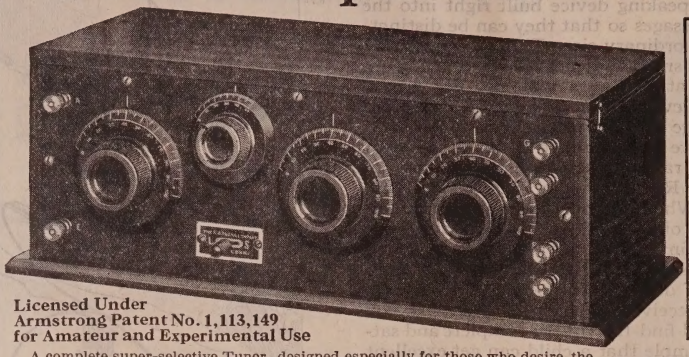


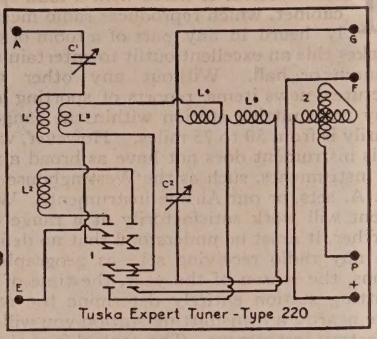
The Complete Outfit Includes:

The Acmefone receiver as described; one detector tube; two amplifier tubes; two small size "B" batteries; one 6-volt, 40-ampere hour "A" radio storage battery; one high grade 2000-ohm telephone headset with Universal plug, and 6 feet flexible connecting cord. Also a complete antenna equipment consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a porcelain wall tube and a ground clamp. Shipping weight, complete, 45 pounds.

663 J 626—Complete outfit..... **$98.00**

Tuska Expert Tuner—Type 220



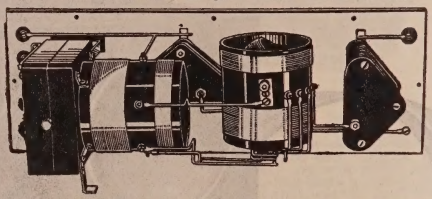


Tuska Expert Tuner-Type 220

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

A complete super-selective Tuner, designed especially for those who desire the most selective and effective tuning system available. This set is what is known as a three-circuit tuner, and the circuit used is of the regenerative type. All wave lengths from 150 to 800 meters can be covered with maximum efficiency. There are two distinct circuits, one with a range of 150 to 385 meters, the other from 375 to 800 meters. Change from one circuit to the other may be effected instantly by means of the 12-point jack switch, the connections to which are so arranged that there are absolutely no dead end or capacity losses from the long wave inductances. The hookup is so arranged that taps on the primary of the coupler are avoided, which makes for more satisfactory operation. A lead shield is provided on the back of the panel, so that capacity effects from the hands and body of the operator are entirely eliminated.

The above diagram shows the circuit of the Tuska Expert Tuner. This is a very effective circuit and the tuner may be constructed easily from the parts listed in this catalogue.



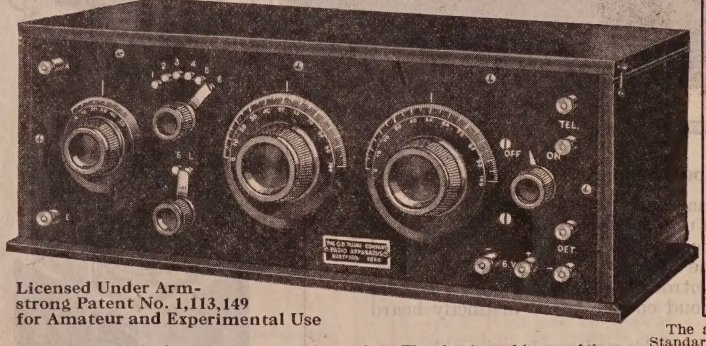
The above illustration shows the interior arrangement of the Tuska Expert Tuner. All parts are symmetrically arranged to give the best radio results with the least possibility of objectionable inter-induction.

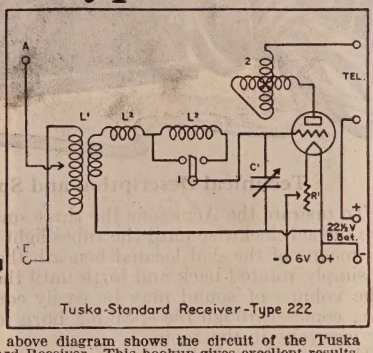
Specifications

Antenna condenser, 43 plate, capacity .001 mfd., fitted with molded knob and dial; diameter, 3⅞ inches. Secondary tuning condenser, 13 plate, capacity, .00025, fitted with molded knob and dial; diameter, 3⅞ inches. High grade Tuska molded plate variometer for regeneration, fitted with molded knob and dial; diameter 3⅞ inches. Coupling control. Long and short wave change jack switch. Satin finished formica panel, 6 by 17½ inches. Polished nickel finished binding posts plainly marked. Polished mahogany finished cabinet, inside dimensions, 6 by 6¾ by 17½ inches. All apparatus is directly mounted on the panel so that all working parts can be removed from the cabinet in one unit. Shipping weight, complete, 18 pounds.

563 J 668—Completely assembled with cabinet **$58.50**

Tuska Standard Receiver—Type 222



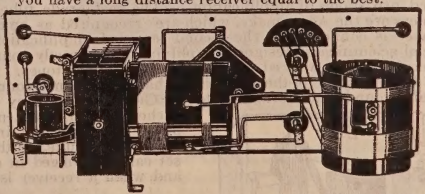


Tuska Standard Receiver-Type 222

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

This is one of the finest Receivers on the market. The circuit used is one of the most effective, and the materials and workmanship are of the very best. It is a complete receiving set in itself, consisting of a tuner directly connected to a detector tube circuit. It is ready for operation upon the connection of aerial, ground, batteries, phone and tube. The Standard Receiver is comprised of an antenna inductance, secondary tuning condenser, plate variometer for regeneration, coupling control, long and short wave switch, grid condenser, rheostat and tube socket. The type of circuit and controls provided make this instrument very selective; in other words, you can more nearly tune in the station you desire to hear without interference from other stations. While this set is very selective, it is not difficult to handle, and is recommended to the beginner or semi-experienced operator who desires a high grade complete outfit for radiophone or C W. and spark code reception.

The above diagram shows the circuit of the Tuska Standard Receiver. This hookup gives excellent results. By adding two stages of audio frequency amplification you have a long distance receiver equal to the best.



The above illustration shows the interior construction of the Tuska Standard Receiver. The parts are symmetrically arranged to give the best radio results.

Specifications

Cabinet size inside, 6 by 6¾ by 17½ inches. Fine polished mahogany finish. Satin finished formica panel, 6 by 17½ inches, with machine engraved markings. Variable condenser, 11 plate, capacity .00025, fitted with one-piece molded knob and dial; diameter 3⅞ inches. Small capacity to enable very fine tuning. Antenna inductance with green silk windings wound on molded tube. Five taps controlled by switch lever. High-grade Tuska variometer, molded type with one-piece knob and dial; diameter 3⅞ inches. Loading coils wound with green silk windings on molded tubes. Changes from short to long waves by means of switch lever. Short wave range, 150 to 385 meters. Long wave range, 375 to 800 meters. High grade filament control rheostat, grid condenser, tube socket. All connections by means of nickel finished binding posts plainly marked. All apparatus mounted on the panel so when panel is removed from cabinet the entire working parts are removed, permitting easy access to every part. Shipping weight, complete, 18 pounds.

563 J 660—Wired complete **$55.00**

Two-Step Amplifier

Same height and depth to match Tuska Standard Receiver. Polished mahogany finished cabinet. Binding posts arranged for direct connections. The second stage of this amplifier increases the audibility more than 100 times. Shipping weight, 9 pounds.

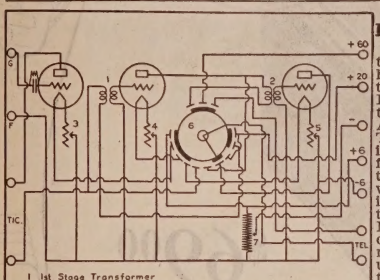
563 J 666..... **$27.50**

Scotland Listens to U. S. with a Paragon

In the late winter of 1922, 200-meter wavelength messages transmitted from Atlantic seaboard towns were picked up in Scotland. With the aid of the two instruments shown below, Paul F. Godley, one of America's leading radio men, while at Ardrossan, Scotland, received messages sent from various amateur stations on the Atlantic coast. Of course, only the very best instruments are capable of such remarkable results, and these tests and many others have proved that Paragon instruments are among the very best.

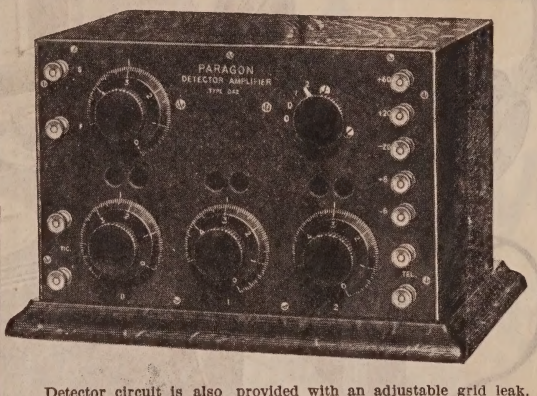
Paragon Detector Amplifier

We have selected this as being the highest grade instrument of its kind on the market. A most efficient hookup is used and the parts and workmanship are of the very best. Overall amplification with this amplifier is at a maximum. It is free from howling and tube noises. May be used in conjunction with any tuner on the market, and is arranged especially for direct connection with regenerative tuners. Grained finish, formica panel 6½ by 10¼ inches. Perfect machine engraved lettering, white filled. All metal parts polished nickel finish. Case is of heavy quarter sawed oak in a fine dull, dark rubbed finish. Top is hinged, giving quick, easy access to the interior. Filament circuit of detector tube is provided with both controlling rheostat and a 300-ohm potentiometer, which permits of very fine adjustment necessary in the modern tube.



Paragon D.A.-2 Circuit

The diagram at the left shows the hookup used on the Paragon D.A.-2 Detector Two-Stage Amplifier. This instrument is made of carefully selected materials by skilled workmen, resulting in a superlative product. However, any one interested in radio can make up an instrument that will work equally well from the materials listed in this catalogue.

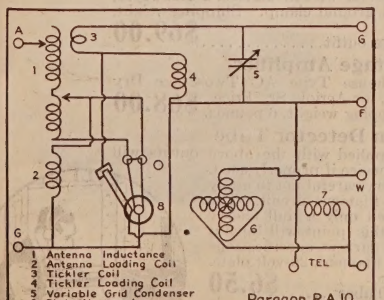


Detector circuit is also provided with an adjustable grid leak. Rheostats and potentiometers are controlled by dial indicators which are superior in operation and appearance to the usual unsightly knobs. Each circuit may be separately connected to the receiver, headset or loud speaker. A special stage controlling switch progressively lights filaments and transfers telephone connections. No jacks or plugs are used. The amplifying transformers used are the best available. All connections are made with heavy wire, neatly arranged and enclosed in insulating tubing. No tubes, batteries or phones included. Shipping weight, 12 pounds.

563 J 682 ..... **$62.75**

Paragon R.A.-10 Regenerative Tuner

This instrument incorporates the best radio construction. It is made of the finest select materials by experienced, skilled radio workmen, and the performance of the instrument justifies the claim that it is the finest short wave receiver in the world. Easy to handle even in the hands of inexperienced persons; and in the hands of experts it has broken all records for long distance reception. Greatest efficiency is attained on wave lengths of 200 meters, but superior results are also obtained at wavelengths of 360 meters. Will function perfectly over wavelengths ranging from 160 to 1000 meters. The units are arranged for greatest efficiency and convenience of operation. Absolutely free from body and capacity effects, so that the circuits may be rapidly and easily adjusted.



Paragon R.A.-10 Circuit

The diagram to the left shows the circuit used in the Paragon R.A.-10 Receiver. This is a very efficient hookup that has proven to be one of the best ever devised. Many amateurs have constructed equally efficient sets from standard parts. On Page 25 you will find blueprints listed that give complete information on similar hookups.

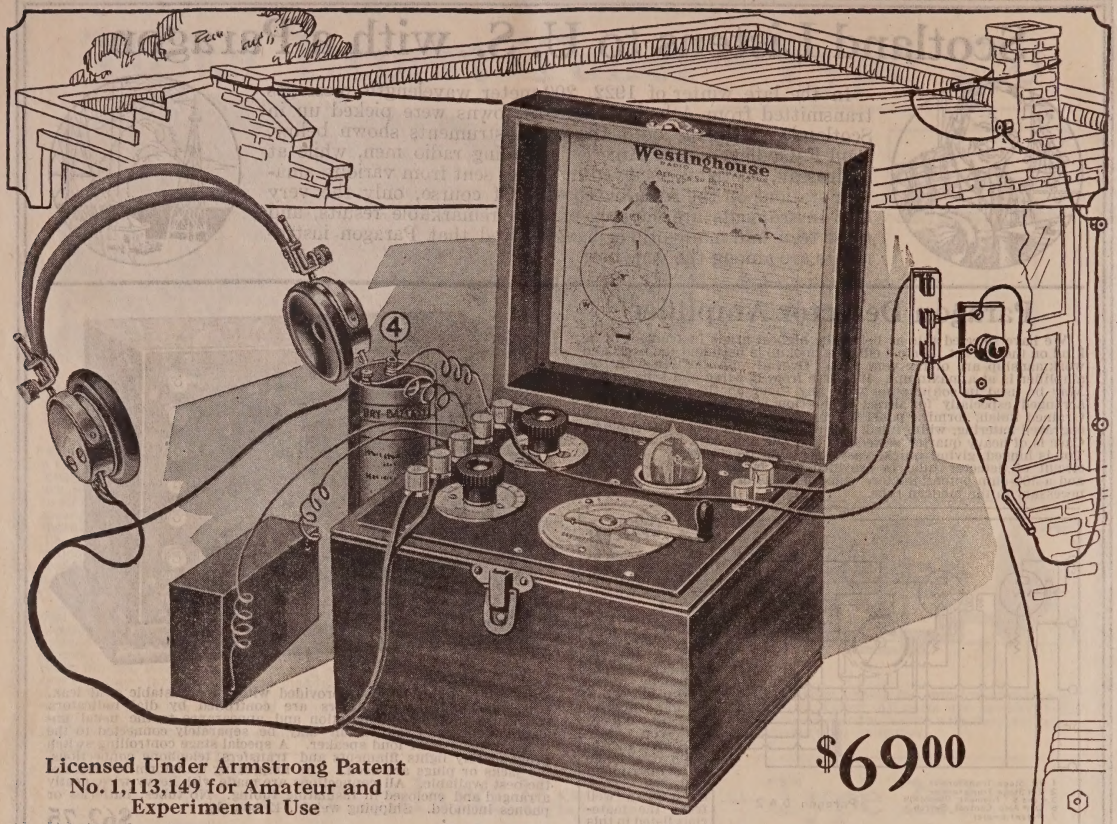
Licensed Under Armstrong Patent No. 1, 113, 149 for Amateur and Experimental Use

The instrument is inductively coupled. The primary of the coupler which composes the antenna circuit has two sets of taps, twelve of very fine control and twelve of coarser control. The secondary is controlled by a dial and operates through an arc of 180°. In receivers of this character, adjustment of coupling is delicate. The large arc of the secondary makes it easier to obtain these adjustments. The variable condenser is bridged across the coupler secondary. It is recognized that this is the best way to control the grid circuit. High grade variometer with molded stator and rotor forms is wired in the plate circuit. A special switch is provided for changing from long to short waves.

Details

Formica panel, 19½ inches long, 6½ inches wide, oil rubbed, grained finish. Engraved lettering filled in with contrasting white enamel. Metal parts polished nickel finish. Dials of polished black molded condensite. Inductances wound on formica tubes. Heavy quarter sawed oak cabinet, fine dark rubbed finish. Each dial fitted with a fine (vernier) control. Ship. wt., 20 pounds.

563 J 683 ..... **$72.75**



Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

$69.00

Westinghouse Aeriola Sr. Receiving Set

This receiving set is so simple to operate that a child can get good results with it. Its special features enable it to receive messages distinctly from far distant stations as well as any of the more complicated sets of the same type, and better than many of them. These sets used in Chicago during the last season regularly received the radiophone concerts sent out from Detroit and often picked up Pittsburgh, besides many other nearby stations. It must be understood, however, that no definite receiving range can be given on any radio receiving set, as the local atmospheric conditions, geographical location, season of the year, time of day and strength of the transmitting station entirely govern the range of a receiving outfit.

The whole outfit is so compact and light in weight that it can be easily carried around, and because of its simplicity it can be set up and put in operation in just a few moments. The tuner, one single dry cell, a small "B" battery, one set of telephone head receivers and an antenna outfit make up the entire set, and the net weight is only 11 pounds.

This is a wonderful little outfit for home entertainment. Can be quickly set up in any room on a table or sideboard. Make the connections and you can tune in to hear the radiophone programs, music, news items, market reports, stock reports, speeches.

Because of its compactness and light weight you can easily move it about and give entertainments in your church, hall, or your neighbor's house. In the summer when you make auto trips you can take this outfit along. Tie the antenna wires to a couple of trees, or from a tree to your car, connect up the outfit and you are ready to "listen in." No matter where you may go you can pick something interesting from the air almost any time with this outfit.

Specifications: The tuner is of the single circuit type, the antenna circuit being tuned by a variometer; taps being entirely eliminated. A special condenser with leads giving two different capacities is provided. One connection gives wavelength range of 180 to 350 meters, the other 300 to 500 meters. Regeneration is by means of a combination tickler coil and variometer mounted beside the antenna circuit inductance and connected in the plate circuit. Filament control rheostat gives very fine control of filament circuit. A grid leak and phone stopping condenser are also provided. Binding posts for all connections. Size of containing cabinet, 8½ by 7¼ by 7 inches.

Complete outfit includes the tuner, as described above; an aeriotron detector tube requiring only one single dry cell for filament circuit; Brandes 2000-ohm telephone headset receivers; American 2½ by 6-inch dry cell; signal corps size "B" battery; complete antenna equipment consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, single pole double throw switch, lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, porcelain wall tube, and ground clamp. Shipping weight, complete, 16 pounds.

563 J 652—Complete outfit..... **$69.00**

Two-Stage Amplifier

63 J 649 — Westinghouse Type AC Two-Stage Dry Battery Audio Amplifier, for Aeriola Sr. Price includes two tubes. Shipping weight, 6 pounds. **$68.00**

Aeriotron Detector Tube

The detector tubes supplied with the above outfits will give many months of service if properly used. The operator must be very careful not to apply too much current to the filament circuit. The filament should be lighted only a dull cherry red. Lighting beyond this point will burn it out very quickly. The current specifications for this tube are 1-volt filament, 20-volt plate. Shipping weight, 1 pound.

563 J 5195—Extra Tubes..... **$6.50**

Short Range Crystal Detector Receiving Sets

THE "heart" of these sets, and the part most mysterious in its action, is the "crystal detector"—from which the sets are named. By means of this device, with the help of the tuning coil, the incoming radio waves are changed in such a manner that speech, music and other sounds are reproduced in the telephone headsets to correspond exactly with the sounds given into the transmitter at the transmitting station. However, too much must not be expected of Crystal Detector receiving sets. They will do what we claim for them, but it should be remembered that they can not equal the wonderful results produced by the more modern equipment, such as a regenerative tuner working in conjunction with a vacuum tube detector and two-stage amplifier.

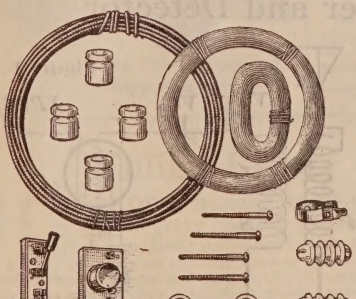
If you want a radio receiving set that will produce the best possible results, we recommend our Airline Special Set, shown on Pages 2 and 3, or the Airline De Luxe Set shown on Pages 4 and 5. Either of these outfits will receive radio messages from far distant stations—stations entirely beyond the range of crystal detector receivers such as those shown below.

Marvel Radio Receiving Set

People who live within 7 miles of a radio transmitting station of commercial power and wish to make only a limited investment in a radio set, will find in this, the "Marvel," a practical set that will receive signals so they can be heard plainly. It will receive radio telephone and radio telegraph equally well. Its range on telegraphy is somewhat greater than on telephone.

The construction of the set is very simple, and with the material supplied it can be put into operation within a few moments. No batteries and no source of power are needed, and there are no parts to break or wear out. The set includes a receiving tuner with tapped tuning coil and a tested crystal detector; single telephone headset with covered headband and flexible connecting cords; and complete antenna outfit, consisting of 150 feet bare copper aerial wire, 5 porcelain insulators, and a single pole double throw switch. A code sheet and instruction booklet also are included. Shipping weight of complete set, 6 pounds.

563 J 659—Complete set..... **$8.95**



Complete Antenna Equipment

Same as supplied with most of our receiving sets. Consists of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to ground, a single pole double throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screw-eyes, a 12-inch porcelain wall tube, 20 feet of annunciator wire, and a ground clamp. Shipping weight, complete, 8 pounds.

63 J 5156—Complete outfit..... **$3.50**

Shipped from Stock in Portland, Ore.

Westinghouse Aeriola Jr.

The Westinghouse Company produced this outfit so that every American home could have a complete radio receiving set at a low cost. It has an effective receiving range of approximately 10 miles, and if you are located within that distance of a radio transmitting station you can receive messages distinctly. It will receive either radio telephone or telegraph, and on radio telegraph its range is considerably more than 10 miles. Under favorable conditions it will receive radio telephone messages as far as 25 miles and radio telegraph messages from stations as far distant as 100 miles or more. The complete set can be installed easily. It is so simple in operation that a child can get results with it. All the essential parts required to make an efficient tuner of this type are included. The tuning is effected by means of a variable inductance controlled by a lever which constitutes the only adjustment necessary, except for an occasional setting of the detector. The crystal detector changes the incoming current so that sounds are produced in the headset receivers exactly the same as they are sent out from the transmitting station. The outfit includes a high grade receiver set and complete antenna equipment consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, single pole double throw switch, lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, porcelain wall tube and a ground clamp. Connections are simple and easy and the set can be put into operation very quickly. Wave length range, 195 to 500 meters. Shipping weight of complete set, 9 pounds.

563 J 656—Complete set..... **$27.95**

Airline Jr. Crystal Receiver

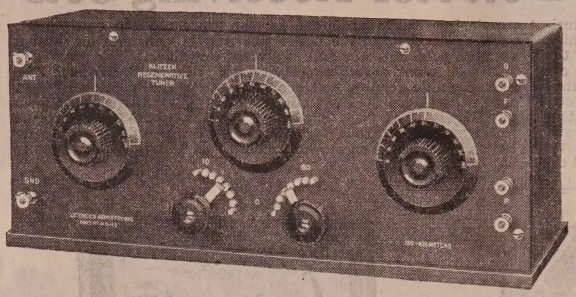
This is a very well made Crystal Receiver Set that will bring in messages over as long a distance as any receiver using a crystal detector. It is very efficient in design. The tuning is done by means of a lever which makes contact on the antenna circuit coil and is controlled by a knob and dial mounted on the panel. Detector crystal is enclosed in protecting glass case. Marked binding post connections for aerial, ground and headset. No batteries or other source of power is needed. This set has an effective range for receiving radiophone messages of about 10 miles. Under favorable conditions it will receive over distances as great as 25 miles. Mahogany finished cabinet, 6 by 4 by 4 inches. Price is for tuner and detector only. No headset or antenna equipment included. Shipping weight, 4 pounds.

63 J 6292..... **$7.40**

Reliable Radio Sets and Supplies

In this catalogue is shown the pick of the merchandise to be had in the entire radio field. We have carefully selected reliable instruments and apparatus made by foremost manufacturers. Quality, service and value are the salient points upon which we insisted, and we pass them on to you. Apparatus shown in this catalogue is made by such prominent manufacturers as The Radio Corporation of America, Westinghouse Electrical and Manufacturing Co., The Acme Apparatus Co., C. D. Tuska Co., Adams Morgan Co. (Paragon), and many others equally well known.

Short Wave, Long Distance Regenerative Tuner



Solid Mahogany Cabinet Polished Finish

This instrument makes possible the reception of messages to which other types of apparatus will not respond. The range is from 150 to 425 meters and by the addition of external loaders, such as the inductance coils shown on Page 24, this range may be raised as desired. Properly handled, signals may be read from stations at extreme distances or through heavy static and interference. The antenna and closed circuits are inductively coupled and the coupling is variable. Regeneration is obtained by tuning both the grid and plate circuits to resonance with the incoming signal. Highest efficiency and amplification are obtained by reducing capacity and resistance in circuits to absolute minimum, and the best regenerative effects are secured by the use of properly designed variometers. These instruments are known as three-circuit tuners. They are not quite as simple to handle as some other types of tuners, but properly handled, they give better results than any other type of tuner on short wave reception, such as radiophone broadcasting. With an hour's practice anyone can handle these sets as effectively as an expert. Shipping weight, 10 lbs.

563 J 610 ..... **$29.50**

$29.50 **Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use**

Specifications Short Wave Long Distance Regenerative Tuner

The inductive coupler consists of a primary, the inductance of which is varied by two 7-point switches, and a rotating secondary. By means of this arrangement, very fine tuning is possible. Two variometers tune both grid and plate circuits. High grade dials and knobs fitted to variometers and couplers, finely graduated scales in contrasting white enamel. Inductance switch has a smooth working positive contact. Panel, 6¼ by 16 inches, of condensite celoron, satin finish, finely machine engraved. Binding posts polished nickel finish. Cabinet solid mahogany, polished finish, 6 inches deep.

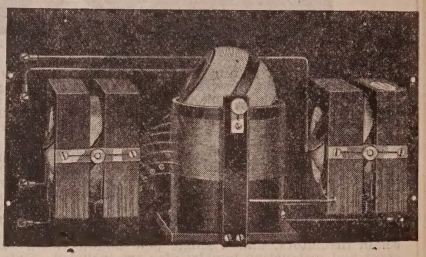
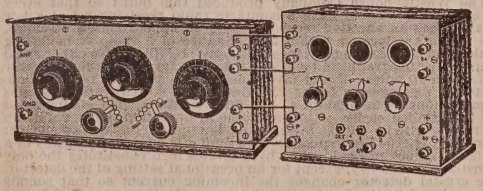


Illustration Shows Method of Wiring

The picture to the right shows the very simple method of wiring used in this tuner. The circuit has been very carefully worked out to avoid complicated connections, thereby resulting in a set which works at maximum efficiency.

Connection and Diagrams of Tuner and Detector



Showing Connection of Regenerative Tuner and Detector Two-Stage Amplifier

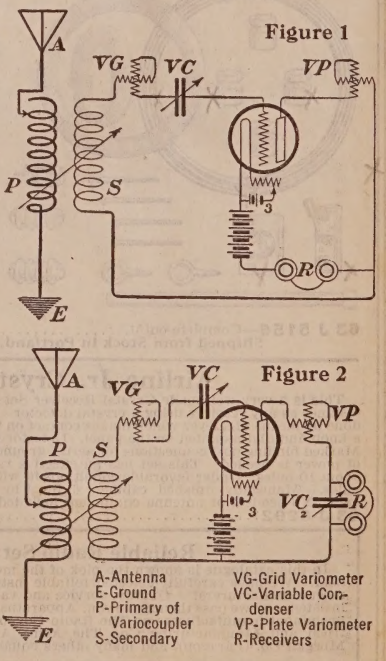
The illustration above shows how our regenerative tuner and detector and two-stage amplifier can be connected. Binding posts are arranged so that connections are direct without unsightly wiring. These two units working together are capable of producing results equal to the best sets on the market. They are very sensitive and efficient. Connected to a good outdoor aerial, their range is limited only by the power of the transmitting station, and their stations hundreds of miles away have been heard regularly. Very good results are obtained with indoor aerials such as the one shown on Page 34. The range, of course, is not equal to the range when connected with a good outdoor aerial; but for use in cities where it is desired to listen in on a local broadcasting station, an indoor aerial is very convenient. Not only is it unnecessary to have any outdoor wiring, but interference from other stations can be greatly reduced, due to the fact that a loop aerial such as this, can be directed toward the station from which signals are desired, and signals from other stations thus greatly reduced or even entirely eliminated.

Figure 1

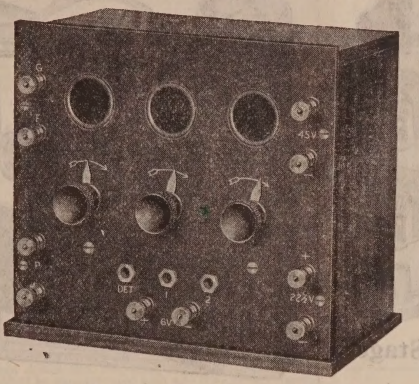
This diagram shows a popular type of Armstrong regenerative circuit. The circuit used in the above regenerative is the same as this. The variable condenser, tube, batteries, etc., are not included in the tuner. This circuit is generally considered as giving the best results of any of the regenerative circuits. The grid and plate are each tuned, are in one continuous circuit and are not affected by the impedance of the receivers, as is the case in some other types of hookup.

Figure 2

Another type of Armstrong regenerative circuit. It varies from the circuit shown above in that the receivers are placed in the same circuit with the grid and plate. This hookup gives effective results, but is not generally considered to be as good as that shown in Figure 1.

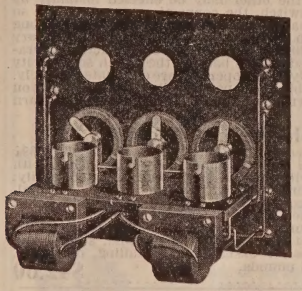


Detector and Two-Step Amplifier



This is a very compact, well arranged instrument, neat in appearance and very efficient in results. It can be used in connection with any type of tuner on the market, but most efficient results are obtained on short wave reception when used in connection with any first class three - circuit regenerative tuner. It is especially designed to work in conjunction with our regenerative tuner. Has one detector and two audio frequency amplifying circuits. Grid condenser in detector circuit. The amplification transformers used are the most efficient available and produce maximum amplification with any standard amplifier tubes. Standard tube sockets mounted on shelf. Provided with jacks so that either a receiver headset or loud speaker can be connected in on any of the three circuits. One plug to fit jacks included. Satin finish bakelite panel; 7½ inches high, 8¾ inches wide. High grade solid mahogany cabinet, polished finish, with hinged top, making interior easily accessible. Binding posts polished nickel finish, plainly marked for all connections. Arranged to use separate "B" battery in detector and amplifier circuits. No tubes, batteries or phones included. Shipping weight, 10 pounds.

563 J 615 ..... **$29.50**



Showing Interior View of Detector and Two-Step Amplifier

The illustration at the left shows the very simple arrangement of this set. The wiring circuit has been very carefully worked out so that "howling," due to induction between wires, is entirely avoided. A well designed set, both mechanically and electrically.

How To Order

Before ordering Radio Sets or Supplies from this Catalogue, see Page 50. We have made it easy for our customers to order.

Filling Empty Churches

HUNDREDS of country churches, long pastorless, can now be opened every Sunday, filled with an eager, interested congregation, their influence in the community revived—by Radio.

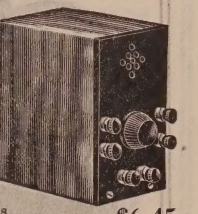
A radio receiving set and loud speaker "picks up" the entire service from a broadcasting station or from a church service in some not too far distant city. Songs, in which the congregation joins, choir music, prayers, sermons—the service complete is transmitted by air to these isolated country churches.

This is but one of the many uses for radio in the church, to big congregations as well as small ones. Radio brings the music of great choirs, inspiring sermons of nationally known ministers and missionaries, educational lectures, and entertainment of all kinds to church and Sunday School gatherings.

It is a small investment considering the unlimited opportunities it affords for creating interest and broadening the religious and educational work of the church.

Detector and Amplifier Units

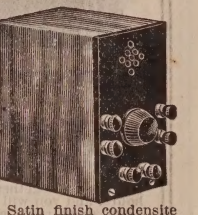
Detector Panel in Cabinet



This unit is so arranged that any type of detector circuit can be used. Satin finish condensite celeron panel. Fine finish solid mahogany cabinet with hinged top. Binding posts for all connections. High grade filament control rheostat. Molded tube socket to take any standard tube. Grid condenser in grid circuit. Shipping weight, 3 pounds.

63 J 6354 ..... **$6.45**

Amplifier Unit in Cabinet



This instrument is arranged to work in conjunction with the above detector unit in cabinet. Binding posts are arranged for straight wiring connections between detector and amplifier. High grade filament control rheostat. Molded tube socket to take any standard tube. Very efficient amplifying transformer. Satin finish condensite celeron panel. Solid mahogany cabinet, finely finished. Produces results equal to the highest grade amplifier unit. Shipping weight, 4 pounds.

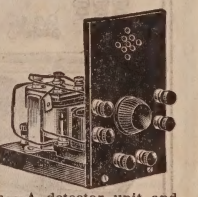
63 J 6356 ..... **$9.80**

Detector Unit

This is a very efficient detector unit. Satin finish condensite celeron panel, 3½ by 6 inches, mounted on wood base. Binding posts with insulating knobs for all connections. High grade filament control rheostat. Molded tube socket to take any standard tube. Grid leak condenser in grid circuit. The wiring is arranged so that any type of vacuum tube circuit can be used. Shipping weight, 2 pounds.

63 J 6350 ..... **$4.70**

Amplifier Unit



A very effective amplifier unit, designed for use in connection with the above detector unit. Satin finish condensite celeron panel, 3½ by 6 inches. Mounted on wood base. Binding posts arranged for straight wire connections to our detector unit. High grade filament control rheostat, molded tube socket. Very efficient amplifying transformer. A detector unit and two amplifier units can be wired together and when used in conjunction with any type of tuner, make a very effective tuning set for either radiophone or code signals. Shipping weight, 3 pounds.

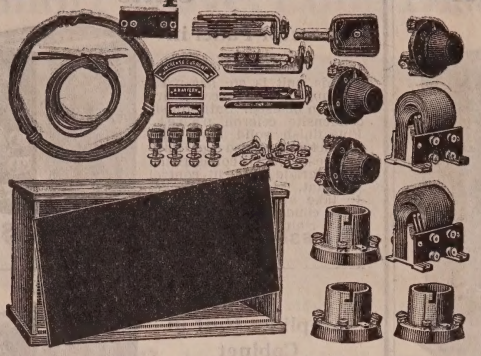
63 J 6352 ..... **$8.10**

V. T. Control Panel

This is a real utility device, for it may be used either for detector control, for amplifier control, alone or in cascade; and for the control of power tubes either singly or in groups. The indestructible condensite base is molded and has a beautiful, glossy black finish. In the base is mounted a standard V. T. socket, a filament control rheostat (6 ohms, 1½ amps.), a grid leak condenser of just the right capacity, and nine terminal posts which instantaneously adapt the unit to any known vacuum tube circuit. Metal fittings are polished nickel finish. Insulating qualities of base are very high; base is heatproof. Unit may be used in any position. Outside dimensions, approximately 5 by 3⅛ by 1¾ inches. Shipping weight, 2 pounds.

63 J 5108 ..... **$4.68**

Four Special Knocked Down Receiving Sets

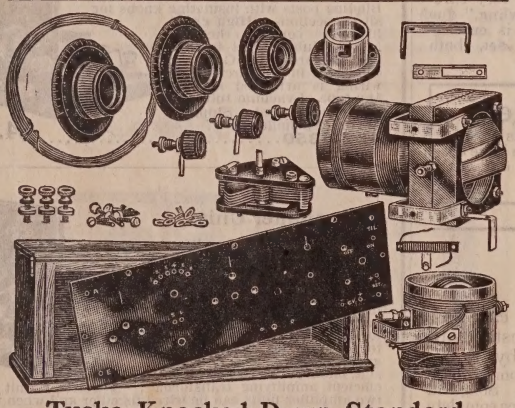


Knocked Down Detector Two-Stage Amplifier

This set contains all the parts necessary to make a high grade detector two-stage amplifier. Materials supplied are of the very best quality and the results obtained from the completed instrument will compare favorably with any other similar instrument on the market. We supply illustrated instructions, telling clearly how to put the set together. The parts can be assembled easily in a few hours, and you will save money by making your own set. What you learn about radio while doing the assembling will greatly increase your pleasure and enjoyment. The instrument when completed can be used with any type of tuner.

The Complete Set Includes:

Solid mahogany cabinet, polished and hand rubbed finish; condensite celeron panel 6 by 14 by 3/16 inches; ten binding posts with insulated knobs; complete set of name plates to mark binding posts; three detector audion tube sockets; three high grade rheostats; three jacks; one plug; two audio frequency amplifying transformers; necessary connecting wire; screws for panel; complete instructions.
Shipping weight, complete, 8 pounds.
563 J 665—Complete set..... **$18.75**



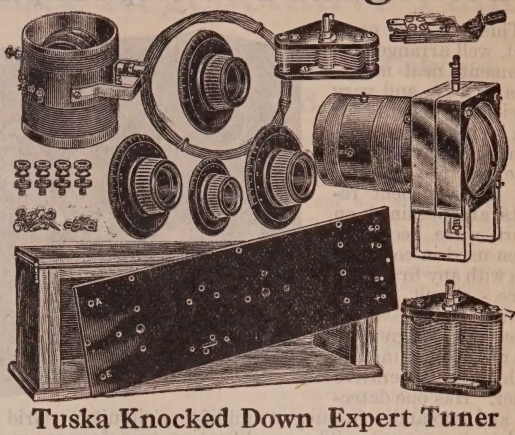
Tuska Knocked Down Standard Receiver

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

A complete set of parts to build up a combined super-selective tuner and audion detector like that shown on Page 10. The circuit used is one of the most effective, and the materials are of the very best. While this set is very selective, it is not difficult to handle, and is recommended to the beginner or experienced operator who desires a high grade tuner with detector unit. The parts can be assembled easily in a few hours. You will save money by assembling your own set, and what you learn about radio while doing so will greatly add to your pleasure and enjoyment.

The Complete Set Includes:

A finely polished, mahogany finished cabinet, 6 by 6¾ by 17½ inches; satin finished bakelite panel with holes properly drilled and arranged so all parts may be fitted easily; 11-plate variable condenser with molded knob and dial, diameter 3⅞ inches; molded variometer of polished black composition; two taps and a switch lever with a molded composition knob and pointer for short and long wave switch; high grade filament control rheostat; grid condenser; tube socket; wires for connections; binding posts; nuts; screws and washers; also complete instructions for assembling, installing and operating.
Shipping weight, complete, 18 pounds.
563 J 661—Complete set..... **$39.95**



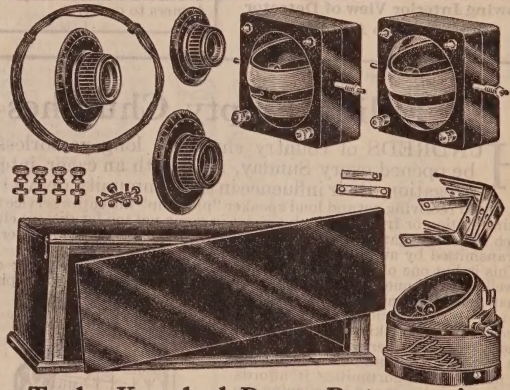
Tuska Knocked Down Expert Tuner

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

A complete set of parts to build up a super-selective tuner like that shown on Page 10. Designed especially for those who desire the most selective and effective tuning system available. This set is what is known as the three-circuit tuner, and the circuit used is of the regenerative type. All wave lengths from 150 to 800 meters can be covered with maximum efficiency. There are two distinct circuits, one with a range of 150 to 385 meters, the other from 375 to 800 meters. Change from one circuit to the other may be effected instantly by means of the 12-point jack switch, the connections to which are so arranged that there are no dead end or capacity losses from the long wave inductances. The hookup is so arranged that taps on the primary of the coupler are avoided, which makes for more satisfactory operation. A lead shield is provided on the back of the panel, so capacity effects from the hands and body of the operator are eliminated entirely. In a few hours you can assemble these parts easily. Not only will you save money by doing your own assembling, but you also will learn much about radio.

The Complete Set Includes:

Polished, mahogany finished cabinet, inside dimensions, 6 by 6¾ by 17½ inches; satin finished bakelite panel, 6 by 17½ inches, with holes properly placed and drilled so all parts may be fitted easily; 43-plate variable antenna condenser with molded knob and dial, diameter 3⅞ inches; variocoupler with molded stator and rotor; variometer molded of polished black composition; short and long wave switch; loading coil wound on form so all connections may be made easily; wire for connections; binding posts; nuts; screws and washers; complete instructions for assembling, installing, operating.
Shipping weight, complete, 18 pounds.
563 J 669—Complete set..... **$42.60**



Tuska Knocked Down Regenerative Tuner Set

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

Furnished complete with two variometers, variocoupler, switch lever and contact points, dials, connecting wire, binding posts, and panel 6 inches high and 17½ inches long. All parts can be assembled easily in the proper relative positions to make a solid, high grade instrument. The variometer and variocoupler are the molded type, and are the best instruments of their kind. The dials are very neat, being molded in one piece with the knobs. Numerous wiring circuits can be used. The wave length range is from 180 to 600 meters. Mahogany finished cabinet in polished, hand rubbed finish.
Shipping weight, complete, 10 pounds.
563 J 678—Complete set..... **$26.50**

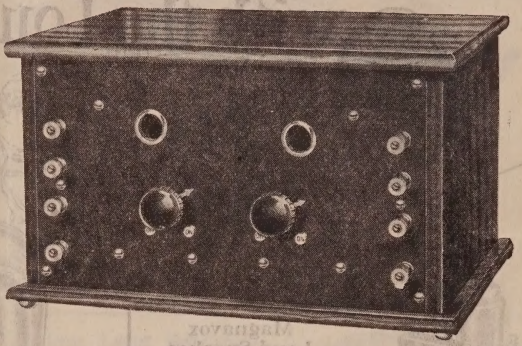
Airline Two-Stage Audio Frequency Amplifier

This instrument can be used in connection with either a crystal or audion detector, to amplify radio signals. It will increase the volume of sound at least 100 times. You do not get the fullest enjoyment from your radio outfit unless you use an Amplifier, as a detector alone will not bring in all of the signals that it is possible for you to get. Add this instrument to your outfit and you will greatly increase your receiving range. Not only this, but by attaching a loud speaker to your outfit, radio programs can be reproduced loud enough so they can be heard all over an ordinary size room.

Audion tubes in conjunction with audio frequency amplifiers, comprise the working part of this instrument. The radio current enters the first transformer, from whence it passes through the first amplifier tube. From the tube it passes through the second transformer. From the second transformer the current passes through the second amplifier tube, and at this point the current is more than 100 times stronger than when it leaves the detector. Because of careful engineering and high grade materials, this instrument is entirely free from howling and other objectionable noises. All working parts are mounted on a panel and can be removed from the cabinet as a unit if desired.

Details: Sockets mounted on genuine bakelite bases. Positive contact spring connectors at right angles with each other. Controlling rheostats regulate filament current in finely divided steps. Bakelite panel, 6 by 10½ inches. Highly efficient audio frequency transformers. Binding post connections for input, output and A and B batteries, all plainly marked. Handsome mahogany finished cabinet, 8½ by 12 by 7 inches. Shipping weight, 6 pounds.

63 J 603.....**$21.00**



See Illustration Below

The illustration below shows our Airline Special Detector Tuner and our Airline Two-Stage Amplifier working together. These two instruments match each other in appearance and are connected easily. When used together they will produce results equal to the best instruments of this type.

The prices we quote on these items will enable you to get a better outfit for your money than it is possible to obtain elsewhere. We are able to make such attractive prices because these instruments are specially manufactured for us by one of the largest and most efficient radio factories in the country. The production cost is low, and to this is added only our one profit. While the price is low, the quality is high. We guarantee these instruments to produce results equal to or better than any instruments of their type on the market. If you are not entirely satisfied with the purchase, you may return the goods to us and we will gladly refund the purchase price, together with any transportation charges you have paid.

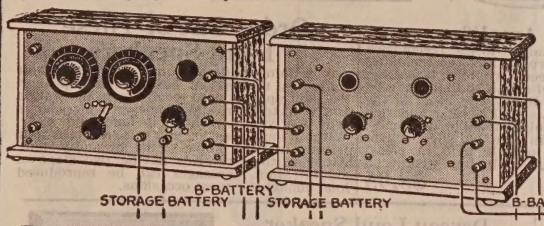
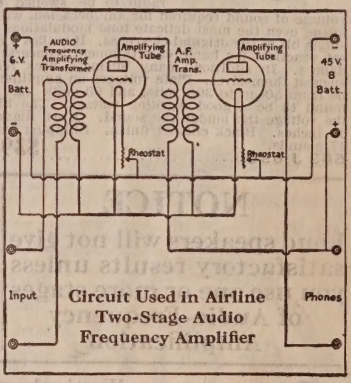


Diagram Shows Circuit

The diagram to the right shows circuit used in our Airline Two-Stage Amplifier. This is a very efficient hookup and is the simplest made. The phones are only connected on the second stage which makes for easier construction. You can easily build an instrument of this kind with the parts listed in this catalogue. The cost will be low and the results obtained, if care is exercised in the construction, will be very satisfactory.



Circuit Used in Airline Two-Stage Audio Frequency Amplifier

Detector Unit

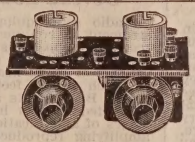
Consists of an audion tube socket mounted on bakelite base, 3 by 3½ inches. To this panel is attached grid condenser and vernier control rheostat, the elements being wired together so they are connected easily to the tuning device and batteries. Unit can be mounted on set with only two screws. Shipping weight, 1½ pounds.

63 J 6104.....**$2.19**

Amplifier Unit

Same as above, except with audio frequency amplifying transformer added and condenser omitted. Shipping weight, 3 pounds.

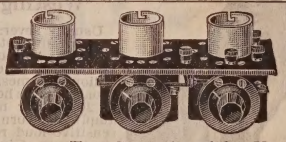
63 J 6107.....**$5.89**



Detector Amplifying Unit

This unit consists of detector unit as described at left; mounted beside the detector unit is an amplifier unit consisting of tube socket, audio frequency amplifying transformer and regular filament control rheostat. The bases of the two sockets are in one solid panel, 6 by 3½ inches. Units are wired together for direct connection to tuner output and batteries. Shipping weight, 3½ pounds.

63 J 6105.....**$8.20**



Detector Two-Stage Amplifier Unit

Same description as unit at left, except with one additional step of amplification added. Sockets are mounted on bakelite panel, 9 by 3½ inches. All parts attached. Units wired together for direct connection to tuner, phones and batteries. Shipping weight, 5 pounds.

63 J 6106.....**$14.20**

Knocked Down Tuner Detector Set

This set contains all the parts needed to make a first class receiving set. Will regularly bring in stations 100 miles or more distant, and under favorable conditions will bring in stations 500 or more miles away. Wavelength range, 150 to 650 meters.

Details: Bakelite panel, 7 by 10 inches, oil rubbed satin finish. Instruments and connections plainly marked with machine engraving filled in with contrasting white enamel. Proper size holes are drilled in panel so all parts can be mounted quickly and securely. Antenna inductance is of green silk covered wire. Three taps for fine tuning; 23-plate variable condenser in antenna circuit permits of very close tuning. Detector socket Vernier control rheostat. All connections can be made at rear of set permitting very neat connections. All connecting wires cut to length and bent so wiring can be done readily. Complete instructions for assembling included. Shipping weight, per set, 4 pounds.

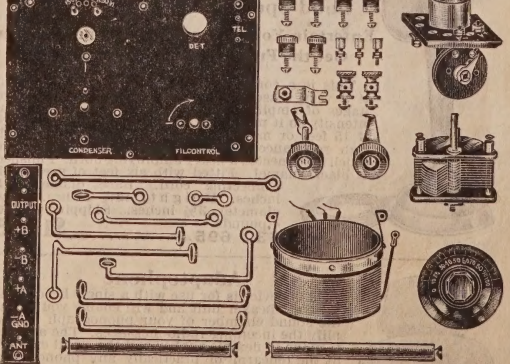
63 J 6101—Without cabinet. Per set.....**$16.95**

63 J 6099—Cabinet only. Shipping weight, 10 pounds **3.20**

Same as above set, except two stages of amplification added, providing for, in addition to parts specified, two audio frequency transformers, two amplifier tube sockets, two regular filament control rheostats and the necessary additional connecting wires. Panel size, 7 by 16¼ inches. Shipping weight, 10 lbs.

63 J 6103—Without cabinet. Per set.....**$35.95**

63 J 6102—Cabinet to take tuner detector two-step unit **3.90**



The Entire Family Hears the Program with the Loud Speaker

Magnavox Loud Speaker

Substituted for the headset, the Magnavox enables everything received by radio to be swelled to a volume of sound required for any occasion, without losing even the most delicate tone modulations or a single bit of the original clearness. It makes a radio set practical for home entertainment, concerts and dances. In addition, many business uses readily suggest themselves. Plate voltages on amplifier can be from 50 up to 300 volts, and 90 volts has been found to be a good working voltage. The higher the voltage the louder the sound. Horn diameter, 14 inches. Black enamel finish. Shipping weight, 17 pounds.

563 J 690 ..... **$39.50**

Wood Fiber Clear Speaker

This clear tone Loud speaker is die cast of wood fiber, and reproduces radio sounds with the rich resonance of a seasoned wood sounding chamber. The tones are sweet and clear and are amplified to a remarkable degree. This instrument presents a handsome appearance. It is artistically modeled, giving it the appearance of genuine carved wood. Rich old Roman gold finish. Designed for use with any loud speaking unit. We recommend either our Special Unit or the Baldwin Type C. No unit is included. Height, 20 inches. Shipping weight, 6 pounds.

63 J 714 ..... **$9.75**

NOTICE

Loud speakers will not give satisfactory results unless you use one or more stages of Audio-Frequency Amplification

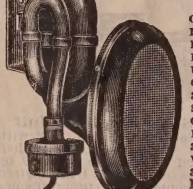
Headset Amplifier

Just attach the headset to the receptacles provided for that purpose and the incoming message — music, speech, whatever it may be, is swelled in volume of sound so that it can be heard all over any ordinary size room in the home. The amplified sound is clear and rich in tone and without objectionable overtones. Made of aluminum in fine polished finish. Headsets easily and quickly held in place. Height, 16½ inches. Shipping weight, 5 pounds.

63 J 713 ..... **$8.95**

Order One of These Loud Speakers

You do not get maximum benefit from your radio set unless you have a loud speaker. Set your apparatus to receive from the station you want to hear, and whenever a message is sent out you will hear it loud and clear. With a loud speaker, you can entertain your friends in your home or in an auditorium. Attached to a receiver having two steps of amplification, messages can be reproduced loud enough for most occasions.



Westinghouse Vocarola

Usually several people want to listen in on the radio set at one time. This instrument makes it unnecessary to have a separate headset for each person, as it reproduces radiophone messages loud enough so they usually can be heard distinctly for a distance of 20 feet or more. Consists of a metal amplifying horn to which is adapted a very sensitive loud reproducer. Produces pure, clear tones. Gives excellent results with any receiving set having one or two stages of amplification. Very compact. Furnished with six feet of cord and plug to connect to amplifier jacks. Can be laid on table or hung on wall. No battery currents required. Shipping weight, 3 pounds.

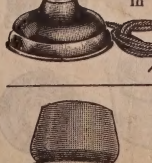
563 J 691 ..... **$20.00**

Federal Pleiophone Loud Speaker (Improved Model)

Entertain Your Friends with a Loud Speaker
Get the Full Benefit of Your Radio Set

This is a complete loud speaker, and is offered at a very reasonable price. When used with two stages of amplification it will give sufficient signal intensity so it may be heard distinctly for a distance of 15 feet or more. Consists of a specially wound, high resistance receiver mounted in the base, to which is connected a heavy amplifying horn. Finished in black enamel. Fitted with six feet of green silk connecting cord. Base diameter, 5 inches. Height, 12½ inches. Bowl diameter, 3⅝ inches. Shipping weight, 4 pounds.

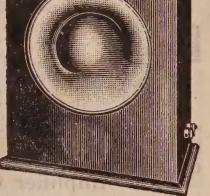
63 J 695 ..... **$12.95**



Adaptophone

This device is for use with a single headphone or loud speaker unit and will enable you to use the sound chamber of your phonograph to amplify the incoming radio messages. The adapter is made of flexible rubber and the small end will fit the tonearm of practically any phonograph; the large end will take any receiver unit. Shipping weight, 4 ounces.

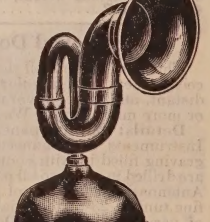
63 J 6299 ..... **69¢**



Deveau Loud Speaker

Radio sets equipped with this instrument in conjunction with suitable receiving apparatus, will reproduce radio telegraph and radiophone signals capable of being heard in many cases as much as 100 feet from the instrument. Best results are obtained when connected to sets having one or two stages of amplification. Consists of an amplifying reproducer connected to a sound amplifying chamber of special design, which swells the sound to greatest volume without distortion. Shipping weight, 8 pounds.

563 J 692 ..... **$29.50**



Arkay Loud Speaker Radio Horn

With this radio horn you can make your own loud speaker by simply inserting one of the phones from your headset in the base. It is so designed as to reproduce signals, speeches and broadcasting music without distortion, giving a pure and natural tone. Carefully constructed of brass throughout. Black enameled finish. Any make of radio receiver can be used. Best results are obtained with receivers of a Baldwin, our Special or Brandes type. Works best on two stages of amplification, although one stage often produces sounds of sufficient volume. Shipping weight, 4 pounds.

63 J 693 ..... **$3.95**

Double Phonograph Adapter

With the aid of this device you can attach your headset to practically any phonograph and use the phonograph sound chamber to amplify the sound. This combination will swell the sound of the incoming radio signals so they will be reproduced loud and clear and with excellent tone qualities. Shipping weight, 8 ounces.

63 J 6295—To fit our Cecilian Phonograph **$1.60**
63 J 6296—To fit Victrola, Sonora, Silvertone **$1.60**
63 J 6297—To fit Columbia **1.60**
63 J 6298—To fit Edison **1.60**

Our Special High Grade Supersensitive Radio Receiver Headset

This excellent headset is offered at a very reasonable price. Equal in sensitiveness and results to many phones selling at much higher prices. Light in weight and of substantial, durable construction. Every detail has been worked out carefully and only the best materials are used. The workmanship is the best, resulting in a neat appearing, finely finished set. Army-Navy style headband is shaped to give most comfort. Covered with heavy webbing. Adjustment to fit the head is quick, simple and secure. No chance to pull the hair. Metal receiver shells, polished finish, with polished black molded caps. Five-foot connecting cord with enclosed terminals. Equally suitable for use on the highest grade sets or the inexpensive crystal sets. We guarantee these sets to satisfy you. If they do not, return them and we will gladly refund purchase price, together with transportation charges. Shipping weight, per set, 1½ pounds.

$3.95 A Set

63 J 5171—2000 ohms total resistance. Per set..... **$3.95**

Shipped from Stock in Portland, Ore.

Frost Headsets

The product of an old, reliable manufacturer. Has proved very satisfactory under a wide range of conditions. Very sensitive. Guaranteed high quality and assures reliable service and satisfaction. Shells made of molded composition. Web covered headband, easily and quickly adjusted to the head. Shipping weight, per set, 1½ pounds.

63 J 5160—2000 ohms total resistance. Per set..... **$4.45**

63 J 5161—3000 ohms total resistance. Per set..... **$5.35**

Brandes Matched Tone Headsets

These headsets have established themselves as being the best at the price on the market and equal to many selling at higher prices. They are used throughout the world and are famous for their excellent workmanship, durability and extreme sensitiveness. The receivers of each set are very carefully selected, so the tone values of the two receivers of each pair are exactly the same, resulting in the message being heard very distinctly. Improved style, comfortable, easily adjusted. Army-Navy headband covered with webbing. Will not catch the hair. Fitted with 6-foot polarity indicating connecting cord. Shipping weight, per set, 1½ pounds.

63 J 5380—Superior type; 2000 ohms total resistance. Per set..... **$ 7.24**

63 J 5381—Navy type; 3000 ohms total resistance. Per set..... **12.45**

Single Receiver Headsets

A high grade single receiver mounted on a leather covered spring headband. Resistance, 1000 ohms. Especially designed for radio use and very satisfactory where a low priced, sensitive receiver is desired for use in connection with the inexpensive crystal detector receiving sets; 3-foot connecting cord. Shipping weight, per set, 1¼ pounds.

63 J 5383—Per set..... **$2.45**

Watch Case Receiver

Regulation watch case type telephone receiver. Molded composition case. Bipolar. Resistance, 75 ohms. Shipping weight, 12 ounces.

63 J 5384..... **$1.05**

Vocarola Phonograph Attachment

$18.00 Loud toned reproducers fitted with attachments for placing them on a phonograph in place of the regular reproducer. The phonograph sound chamber is the amplifying horn. Connected with the first or second stage of amplification on any good receiving set, radio messages can be intensified to a volume of sound about equal to that ordinarily given off by a phonograph. Shipping weight, 1 pound.

63 J 6364—To fit Victrolas. **$18.00**

63 J 6366—To fit Grafanolas **18.00**

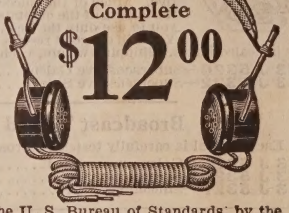
Airline Long Distance Headsets

Extra fine quality. Made especially for us by one of the foremost electrical manufacturers in this country and we believe they will very nearly equal the best results of any headset on the market regardless of cost. They are supersensitive and excellent for long distance receiving. Loud in tone; will stand amplification without distortion. Light in weight, strong in mechanical construction. Shells are molded, mahogany colored, genuine bakelite. Headbands are web covered and are easily and comfortably adjusted to the head. Especially designed for use with better grade receiving sets. Shipping weight, per set, 1½ pounds.

63 J 5168—2000 ohms total resistance. Per set..... **$4.85**

63 J 5169—3000 ohms total resistance. Per set..... **5.60**

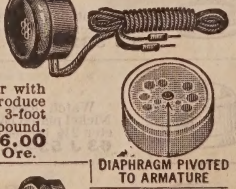
Baldwin Amplifying Type "C" Headset



This is probably the most famous radio receiver. Entirely different construction than any other on the market. It is fitted with special mica diaphragms, actuated by a very thin light armature which is supersensitive to the slightest variation of current passing through the electro magnets. This special type of construction enables signals to be heard which are not audible in the ordinary headset. The high efficiency has caused it to be used by the U. S. Bureau of Standards, by the U. S. Navy and War Department, by many foreign governments, and by various private operators all over the world. The shell containing the mechanism is of molded bakelite. Comfortable web covered headband with firm, quick adjustment. Six-foot connecting cord fitted with universal plug to connect to any radio jack. Shipping weight, 2 pounds.

63 J 5164..... **$12.00**

Baldwin Type "C" Loud Speaker

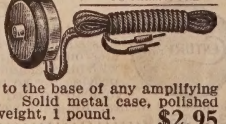


Consists of Baldwin Type "C" amplifying type of reproducer. Attached to an ordinary phonograph by means of our 63 J 6290 adapter, when connected to a receiver with two steps of amplification, will produce very fine results. Complete with 3-foot connecting cord. Shipping weight, 1 pound.

63 J 6367..... **$6.00**

Shipped from Stock in Portland, Ore.

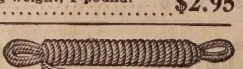
Special Amplifying Unit



Designed especially for use with homemade loud speakers. Will reproduce radio messages loud and distinctly. It consists of a non-distorting reproducer fitted with an adapter which can be attached easily to the base of any amplifying chamber. Three-foot connecting cord. Solid metal case, polished finish, minimizes vibration. Shipping weight, 1 pound.

63 J 5387..... **$2.95**

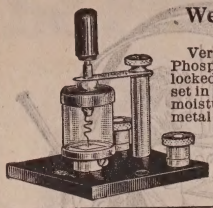
Receiving Cord



Made of heavy mercerized cotton; five feet long. For use with any standard double receiver. Shipping weight, 3 ounces.

63 J 5385..... **70¢**

Weatherproof Detector Stand



Very rugged stand. Perfect, easy adjustment. Phosphor bronze contact spring can be set and locked in any position. A piece of tested galena set in Wood's metal is mounted inside dust and moisture-proof enclosed glass cylinder. All metal parts nickel plated and polished. Formica base, 2 by 2 by 3/8 inches. A very attractive and efficient piece of apparatus. Shipping weight, 1 pound.

63 J 5303.....**$1.38**

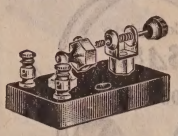
Standard Galena Detector Stand

Improved Model

A popular detector stand. Tested piece of galena is mounted in cup which can be rotated. Crystal contact of phosphor bronze wire coiled and pointed and soldered on flat spring. Very fine adjustment obtainable with screw. Molded base and adjustment knob. Base size, 3 by 3 inches. Shipping weight, 1¼ pounds.

63 J 5305.....**$1.15**

Wizard Detector Stand



This detector is an excellent value for the money. Carefully made of highest grade materials. Uses any detector mineral. Adjustment can be made to any position. Black polished composition base. Metal parts brass, nickel finish. Shipping weight, 4 ounces.

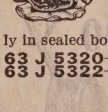
63 J 6535.....**89¢**

Complete Set of Crystal Detector Parts

Complete set of metal parts to make up a high grade crystal detector. Made of brass, nickel finish. No base or crystal included. Shipping weight, per set, 3 ounces.

63 J 6534.....**29¢**

Detector Crystals



Genuine Arlington tested minerals, we are told, are the best that can be purchased at any price. All are thoroughly tested and guaranteed. Extremely sensitive. Much of the success of your set depends upon the quality of the crystals. For this reason it will pay you to use only the best, first grade, tested crystals. You will get good results with these. Packed separately in sealed boxes. Shipping weight, each, 3 ounces.

63 J 5320—Supersensitive Galena.....**22¢**
63 J 5322—Supersensitive Silicon.....**22¢**

Broadcast Tested Crystals

Each crystal is carefully tested on broadcast signals.

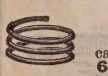
63 J 5325—Galena unmounted.....**10¢**
63 J 5326—Galena mounted.....**14¢**
63 J 5327—Silicon mounted.....**15¢**

Detector Mineral Cup

To hold detector crystal. Made of brass, nickel finish. Holds crystal securely. Easily mounted. Shipping weight, 2 ounces.

63 J 5328.....**9¢**

Cat Whisker Wire



Five-foot piece fine phosphor bronze wire for detector cat whisker. Shipping weight, 1 ounce.

63 J 5329.....**5¢**

Test Buzzer

Watch case buzzer. Operates on one dry cell. Nickel plated cover and base. Height, 1 inch; diameter 2⅛ inches. Shipping weight, 8 ounces.

63 J 5345.....**64¢**

Century Buzzer

Used by the Army and Navy and commercial wireless stations. For adjusting crystal detector. Operates on one or two dry cells. Base is hard rubber with black enameled brass cover. Two thumb screws provide for adjustment of the armature to regulate tone to desired pitch. Genuine platinum contacts. Diameter, 2 inches. Shipping weight, 6 ounces.

63 J 5346.....**$2.19**

Test Buzzer Push Button

For use with test buzzer. Nickel rim with pearl center. Held firmly in 5/8-inch hole by small spring clips. Shipping weight, 4 ounces.

63 J 5137.....**28¢**

Circular Grid Condenser with Grid Leak

Very convenient form of combined condenser and grid leak. Condenser is mounted between two outside metal plates. Hole in center for quick mounting. Mica insulated, copper conductors. Capacity, .0003 MFD; leak, 2 megohms. Shipping weight, 3 ounces.

63 J 6357.....**49¢**

Telephone Bridging Condenser

Same in appearance and construction as above condenser, but made for bridging across telephone terminal. Designed especially for use in standard regenerative receivers and for highest efficiency at 360 meters. Capacity, .0008 MFD. Shipping weight, 3 ounces.

63 J 6358.....**49¢**

Circular Grid Condenser

Grid condenser only. Capacity, .00025. Mica insulated. Aluminum conductor plate. Bakelite end plate. Easily mounted alone or with variable grid leak listed below. Diameter, 1⅞ inches. Shipping weight, 2 ounces.

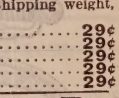
63 J 6359.....**28¢**

Variable Grid Leak

This leak is the same size and shape as the above condenser and can be mounted with it, using same screws. It is so arranged that seven different resistances can be obtained, ranging in ¼ megohm steps from ¼ to 1¾ megohms. Diameter, 1⅞ inches. Shipping weight, 2 ounces.

63 J 6361.....**39¢**

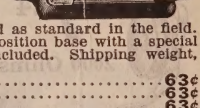
Dubilier Micadons—Type 601



These condensers are made by a patented process which gives them characteristics peculiarly adapted to radio needs. They are recognized as being the best articles of their kind obtainable. Strong, durable construction. Permanently accurate capacities without fluctuations. Can be easily connected in parallel to increase capacity or in series to reduce capacity. Shipping weight, each, 3 ounces.

63 J 6236—Capacity, .0001 MFD.....**29¢**
63 J 6237—Capacity, .00025 MFD.....**29¢**
63 J 6238—Capacity, .0005 MFD.....**29¢**
63 J 6239—Capacity, .001 MFD.....**29¢**
63 J 6240—Capacity, .002 MFD.....**29¢**

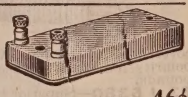
Dubilier Micadons Type 600



Fitted with grid leak mounting and Fahnstock spring binding posts for easy connection. Same high grade construction as above condenser. Recognized as standard in the field. Condenser unit is sealed in molded composition base with a special insulating compound. Grid leaks not included. Shipping weight, 4 ounces.

63 J 6241—Capacity, .0001 MFD.....**63¢**
63 J 6242—Capacity, .00025 MFD.....**63¢**
63 J 6243—Capacity, .0005 MFD.....**63¢**

Fixed Receiving Condenser



A necessity on any receiving set. Used as "stopping" condensers or for shunting across telephones. Molded composition bases. Nickel plated binding posts. Shipping weight, 8 ounces

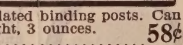
63 J 5364.....**46¢**

Mounted Grid Leak Condenser

Pencil mark type grid leak condenser, mounted between two sheets of bakelite. Connections made through insulated binding posts. Can be fastened to panel or table. Shipping weight, 3 ounces.

63 J 6380—With binding posts.....**58¢**
63 J 6386—Without binding posts.....**40¢**

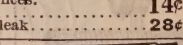
Special Grid Condenser



A well made, rugged condenser made of foil, insulated by paraffine paper and wrapped on a fiber base. Eyelets at each end of base for easy connection. Shipping weight, each, 2 ounces.

63 J 6382.....**14¢**
63 J 6383—With pencil mark type grid leak.....**28¢**

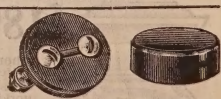
Receiving Condenser



Special type receiving condenser. The foil and insulation are wrapped around a fiber sheet. Connections are made by means of rivets in the ends of the condenser. Very compact. Equal in results to any other phone condenser. Shipping weight, 2 ounces.

63 J 6351.....**12¢**

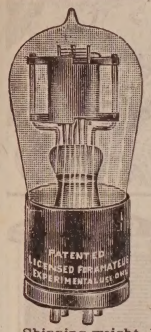
Variable Grid Leak



A grid leak is necessary in the operation of vacuum tube detectors and some forms of amplifiers to permit the surplus charge on the grid to discharge. A variable grid leak is most desirable. The base of this grid leak is molded from bakelite and a pencil mark between the contact studs provides the variable resistance or leak. Two studs are provided with washers and nuts for panel mounting. Shipping weight, each, 3 ounces.

63 J 5341—With stamped brass cap finished in black.....**19¢**
63 J 5342—With very fine quality turned brass cap, polished nickel finish. Better constructed throughout.....**49¢**

The Tubes Through Which Radio Speaks



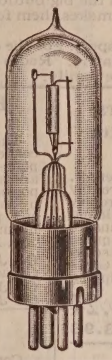
Cunningham C-300 Vacuum Tube Detector

Makes possible the reception of messages to which the crystal detector will not respond. This tube is made especially for amateur and experimental use. Equally suitable for radiophone or code signals. These tubes are the "soft" type, and while especially designed as detectors, they will also give excellent results as audio-frequency amplifiers. They are remarkably free from tube noises and "singing." Fitted with standard 4-prong mounting to fit any standard tube socket. Operate on a plate voltage of 16½ to 22½ volts, filament voltage 5 to 5⅝ volts. For best results a tapped "B" battery should be used. We also recommend that a vernier rheostat be used in the filament circuit, as a very close adjustment of the filament circuit voltage often is necessary to give the best results.

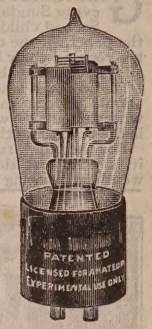
Shipping weight, 1 pound.

63 J 5198 ..... **$4.69**

Shipped from Stock in Portland, Ore.



Cunningham C-301 Amplifier-Oscillator



These Amplifying Tubes, working in conjunction with amplification transformers, are used to increase the audibility of signals passed through the detector tube. One, two or three tubes and transformers may be used in a group, although the most successful and the most satisfactory results are obtained when two are used. These tubes are of a high vacuum type and require no delicate adjustment. They are very uniform and free from tube noises. Besides audio-frequency amplification, these tubes can be used as detectors and radio frequency amplifiers. The normal plate voltage is approximately 40 volts, although increasing amplification can be obtained at plate voltage ranging up to 100 volts. Fitted with standard 4-prong base.

Shipping weight, 1 pound.

63 J 5199 ..... **$6.30**

Westinghouse W. D. 11 Tube

This remarkable Tube operates on 1 dry cell as "A" battery doing away with storage batteries. Single dry cell gives long service. It is especially designed and licensed for amateur and experimental use. Equally efficient as detector or amplifier. Plate voltage for detector about 20 volts; for amplifier, 40 volts. Filament current only ¼ ampere. Easily adjusted.

Shipping weight, 1 pound.

63 J 5195 ..... **$6.50**

Radiotron UV-200 Detector Tube

Same general specifications as Cunningham C-300 Vacuum Tube Detector. Fitted with standard 4-prong base. Operates on a plate voltage of 16½ to 22½ volts, filament voltage of 5 to 5⅝ volts. For best results we recommend that a tapped "B" battery be used in the plate circuit to enable a voltage potential best suited to the individual tube to be applied to the plate. We also recommend that a vernier rheostat be used in the filament circuit, as a very close adjustment of the filament circuit is often necessary. Ship. wt., 1 lb.

63 J 5194 ..... **$5.00**

Radiotron UV-201 Amplifier Tube

Same general specifications as Cunningham C-301 Vacuum Tube Amplifier Oscillator. Fitted with standard 4-prong base. The normal plate voltage is approximately 40 volts, although increasing amplification can be obtained at plate voltages, ranging up to 100 volts. Operates on filament voltage of 5 to 5⅝ volts. Shipping weight, 1 pound.

63 J 5192 ..... **$6.50**

W. D. 11 Tube Socket

For panel or table mounting. Arranged so rheostat may be mounted between tube and panel. Bakelite construction. Binding post connections. Phosphor bronze contact springs. A convenient mounting for one or more tubes. Shipping weight, 6 ounces.

63 J 6403 ..... **42¢**

Socket Adapter for W. D. 11 Tube

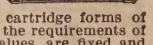
Fits into a standard V.T. socket and makes a convenient method of changing from 6 volt to 1½ volt tubes. Also permits installation of W.D. 11 tubes in sets manufactured to use 6 volt tubes. Bakelite construction. Brass contact pins and springs. A high grade adapter. Shipping weight, 6 ounces.

63 J 6441 ..... **59¢**

Paragon Potentiometer

Completely mounted and fitted with controlling lever and adjustment knob. Suitable for either panel or table mounting. Base diameter, 2⅛ inches. Base height, ⅞ inch. Molded of condensite. Adjustable to panel of any thickness up to ⅜ inch. Permits very close adjustment of plate circuit voltage. Resistance, 300 ohms. Base and knob made of polished black composition. Shipping weight, 8 ounces.

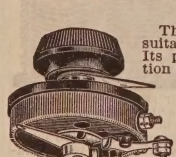
63 J 6368 ..... **$1.39**



Receiving Grid Leaks

Different detection and amplification circuits require grid leaks of different values. These cartridge forms of grid leaks are supplied in resistances to meet the requirements of all circuits ordinarily used. The resistance values are fixed and the ratings are accurate. Various resistances can be obtained by using two or three leaks wired in series or multiple. Shipping weight, each, 2 ounces.

63 J 6372—Resistance, .5 megohm ..... **23¢**
63 J 6374—Resistance, 1. megohm ..... **23¢**
63 J 6376—Resistance, 1.75 megohms ..... **23¢**
63 J 6378—Resistance, 2.5 megohms ..... **23¢**



"A" Battery Potentiometer

This potentiometer voltage divider is especially suitable for short wave radio frequency circuits. Its purpose is to vary the potential of some portion of the circuit with respect to another. The winding consists of a special non-corrosive enameled resistance wire which will resist the wear of the contactor. Also suitable for controlling plate voltage of gas content detector tubes and for balancing the grid to a point of zero, A-C potential, when A-C is used to light the filaments of amplifier tubes. Total resistance, 100 ohms. Base and knob made of polished black composition which will retain its shape and finish indefinitely. Shipping weight, 6 ounces.

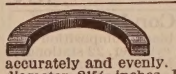
63 J 6384 ..... **$1.19**

Tubular Grid and Plate Condensers

Showing Grid Leak or Condenser Mounted

These condensers are cartridge shape and the same size as the above grid leaks. They can be mounted, interchangeable, in the grid mountings listed below. A tubular grid leak and a tubular grid condenser mounted side by side in a double or triple mounting, permits easy change of grid leak or condenser valve. Shipping weight, each, 3 ounces.

63 J 6371—Capacity, .0001 MFD. ..... **54¢**
63 J 6373—Capacity, .00025 MFD. ..... **54¢**
63 J 6375—Capacity, .0005 MFD. ..... **54¢**
63 J 6377—Capacity, .001 MFD. ..... **54¢**



Graphite Potentiometer

Used for regulating plate voltage of detector tubes. Resistance can be varied accurately and evenly. Nearly pure graphite, molded solid. Outside diameter, 2¹⁵⁄₁₆ inches. Inside diameter, 2¾ inches. Cross section size, 5⁄32 by ⅜ inch. Resistance, 4000 ohms. Ends copper plated. Shipping weight, 3 ounces.

63 J 5620 ..... **$1.10**

Grid Leak Mountings

Consists of two spring clips with screw connections mounted on a Bakelite base. Grid leak cartridges can be readily inserted or removed. Shipping weight, each, 3 ounces.

63 J 6370—Single mounting ..... **38¢**
63 J 6363—Double mounting ..... **56¢**
63 J 6365—Triple mounting ..... **74¢**

Fixed Grid Condenser

The conductors are stamped from sheet copper and are insulated with best grade insulating paper. The entire unit is enclosed and the terminals are spaced so as to mount at the back of the panel on the connecting posts of the grid leak 63 J 5341. Approximate capacity, .00025 MFD, which is the correct value for the new type detector tubes. Shipping weight, 2 ounces.

63 J 6369 ..... **15¢**

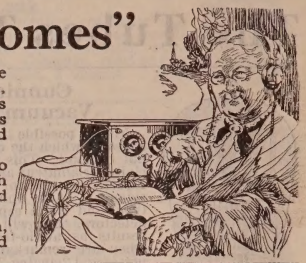
63 J 5331—Mica Insulated Grid Condenser for use in grid circuit of vacuum tube. Approximate capacity, .00025 MFD. Not mounted. Shipping weight, 2 ounces ..... **21¢**

Variable Grid Leak

A variable grid leak with six fixed values varying in half megohm steps from ½ to 3 megohms. Resistance wire mounted on bakelite strip. Each step of resistance has a wire lead which can be attached to a switch point, thereby enabling the resistance to be conveniently varied by means of a switch lever. Shipping weight, 3 ounces.

63 J 6381 ..... **69¢**

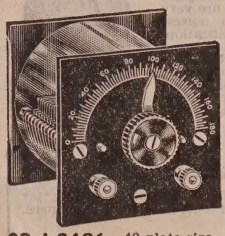
Bringing Happiness to "Stay-at-Homes"



GRANDMOTHER, who scarcely has left her chair for years, is going to church twice every Sunday, to concerts every evening, and yesterday she tuned into a baseball game. Second childhood? No indeed. She has become a radio fan. Each morning she scans the paper for the day's program, decides what she wants to attend, and when the hour arrives her rocking chair becomes a front seat. She is happy and contented for the afternoon—and she is becoming the best informed member of the family.

Radio opens a new world to people shut in by ill health. Receiving instruments are so simple anyone can operate them. Those who are denied the big outdoors, are kept in touch with the outside world by Radio. It holds their interest, makes them forget themselves, and is the best tonic they possibly could find.

For the blind, radio takes the place of books and newspapers. For the crippled or bedridden, it is transportation to churches, concerts, lectures, theaters. Radio bridges distance and weather, bringing pleasures untold to every member of the family.



Variable Condensers

Table Mounting Type with Glass Case

A high grade variable condenser, properly designed and very carefully made. Both stationary and rotary plates stamped from sheet aluminum. Accurately machined spacers insure perfect centering of plates. Square formica sheet ends with engraved scale. Regulating dial and pointer. Glass case protects mechanism. Shipping weight, each, 3 pounds.

63 J 6480—21-plate size. Capacity, .0005 MFD. **$3.24**

63 J 6481—43-plate size. Capacity, .001 MFD..... **3.98**

Variable Condensers

Panel Mounting Type

High grade condensers, perfect in electrical and mechanical construction. Can be mounted on any panel up to ⅜ inch in thickness. Compact, rigid, efficient. ¼-inch shaft.

63 J 6486—43-plate size. Capacity, .001 MFD. Shipping weight, 2 pounds..... **$2.45**

63 J 6485—23-plate size. Capacity, .0005 MFD. Ship. wt., 1½ pounds.. **$1.95**

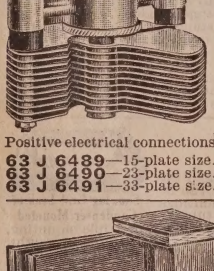
63 J 6484—11-plate size. Capacity, .00025 MFD. Shipping weight, 1 pound..... **$1.45**

63 J 6488—5-plate vernier. Shipping weight, 1 pound.. **1.20**

63 J 6483—3-plate vernier. Shipping weight, 1 pound.. **1.15**

Coto Variable Air Condensers

Panel Mounting Type

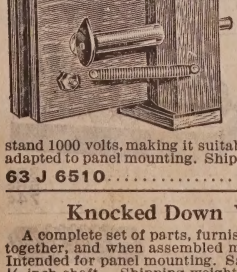


After looking over the market carefully, we do not hesitate in saying that these are the finest condensers to be had today. Their mechanical construction is a step ahead of any other make, and the design and materials used are such that the greatest electrical efficiency is obtained. They are suitable for use in C. W. transmission circuits as well as for reception purposes. Mechanically durable. Solid cast aluminum bearing support. Bearing wear automatically taken up. Will stay in any position. As many plates can be removed as necessary if a smaller capacity condenser is desired. Positive electrical connections. ¼-in. shaft. Ship. wt., each, 2 lbs.

63 J 6489—15-plate size. Capacity, .0005 MFD..... **$3.67**

63 J 6490—23-plate size. Capacity, .0007 MFD..... **4.08**

63 J 6491—33-plate size. Capacity, .001 MFD..... **4.93**



Crosley Variable Condenser

This condenser works on an entirely new principle. Has two plates which are hinged and are opened and closed like a book by means of a special cam arrangement. The plates are surfaced with copper. One copper sheet is covered with mica so that when the two plates are clamped tightly together, maximum capacity is obtained. Rated at .0005 MFD., but maximum capacity will average .0008 MFD. Excellent for receiving circuits and will withstand 1000 volts, making it suitable for C. W. transmission. Especially adapted to panel mounting. Shipping weight, 1½ pounds.

63 J 6510..... **$1.14**

Knocked Down Variable Condensers

A complete set of parts, furnished unassembled. Can be readily put together, and when assembled make a first class variable condenser. Intended for panel mounting. Same high quality as above condensers. ¼-inch shaft. Shipping weight, each, 1½ pounds. **$ .89**

63 J 5182— 3-plate size. Capacity, .00005 MFD... **$ .89**

63 J 5184—11-plate size. Capacity, .00025 MFD..... **1.15**

63 J 5185—21-plate size. Capacity, .0005 MFD..... **1.58**

63 J 5183—41-plate size. Capacity, .001 MFD..... **1.95**

Precision Type Variable Condensers

These are among the best made variable condensers. Genuine aluminum alloy plates, perfectly flat. The stationary plates are set in polished nickel finish mitred posts, insuring an accuracy unattainable by any other construction. Heavy bakelite end plates, finely finished. For panel mounting; ¼-inch shaft. Shipping weights: 2½, 2 and 1½ pounds.

63 J 6387—43-plate size. Capacity, .001 MFD..... **$3.38**

63 J 6388—21-plate size. Capacity, .0005 MFD..... **$3.08**

63 J 6389—11-plate size. Capacity, .00025 MFD..... **2.78**

Balanced Type Variable Condensers

Condensers constructed with half the plates placed opposite the other half so the rotating plates are exactly balanced, insuring their staying in any position. Highest grade materials. Bakelite end plates. Aluminum alloy plates. Heavy ¼-inch shaft. Convenient for panel or table mounting. Shipping weights: 3 and 2 pounds.

63 J 6391—Capacity, .001 MFD **$3.95**

63 J 6392—Capacity, .0005 MFD **$3.20**

Straightline Type Variable Condensers

The special feature of these condensers is the straightline characteristic. Because of this feature, each degree of graduation on a dial indicates an equal variation in wavelength tuning. This enables easy selection of stations of different wavelength when once the values of your set are known. Made of finest materials. Bakelite end pieces. Aluminum alloy plates. Shipping weight, 3 lbs.

$3.58

63 J 6393—Capacity, .001 MFD **3.28**

63 J 6394—Capacity, .0005 MFD **2.98**

63 J 6395—Capacity, .00025 MFD .....

Vernier Type Variable Condensers

These condensers are one of the greatest improvements in radio equipment in many months. They combine the advantage of a strong, well made variable condenser and the fine tuning of the single plate vernier. The illustration shows clearly how this is accomplished. For tuning in either telephone or C. W. signals this arrangement is ideal. The station may be roughly tuned with the large knob and maximum signal strength obtained with fine adjustments of the small knob. The workmanship is excellent. Either knob may be moved without disturbing the adjustment of the other. You owe it to yourself and your set to use these condensers throughout. Plates are of heavy, hard aluminum and will not warp. End plates of bakelite. Spacers between plates are accurately machined. Each condenser is equipped with an attractive knob and dial, engraved with 180 degree scale filled with white enamel; vernier plate is controlled by convenient knob, projecting through center of large dial. Shipping weights: 3, 4 and 5 pounds.

63 J 6111—Capacity, 12-plate .00025 MFD..... **$2.95**

63 J 6112—Capacity, 22-plate .0005 MFD..... **3.40**

63 J 6113—Capacity, 42-plate .001 MFD..... **4.10**

Advertised Brands Variable Condensers

63 J 5175—Murdock No. 367. Polished black composition top and bottom plates with transparent enclosing cylinder, 22 stationary plates and 21 movable plates. Capacity, .001 MFD. Diameter, 3⅞ inches. Length, 3¼ inches. Binding posts and pointer nickel plated; 180 degree engraved scale imbedded in panel. Shipping weight, 2 pounds..... **$4.20**

63 J 5177—Murdock No. 368. Same as above, except has 12 stationary plates and 11 rotary plates. Capacity, .0005 MFD. Shipping weight, 1½ pounds..... **$3.78**

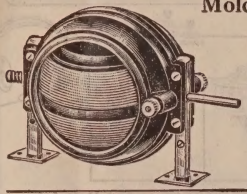
Chelsea Variable Air Condenser—Panel Mounting Style

These variable air condensers embody the same high grade features as those listed above. They are suitable for mounting on any panel up to ⅜ inch thick. They are fitted with a counterweight which is placed on the rotating shaft and exactly balances the rotating plates, so the condenser will stay set at any point it is placed. Complete with dials. Shipping weights: 2 and 3 pounds.

63 J 6497—Capacity, .0006 MFD..... **$3.78**

63 J 6498—Capacity, .0011 MFD..... **4.22**

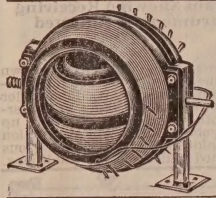
Molded Bakelite Variometer



The finest grade variometer. Careful, accurate workmanship. Scientifically designed for highest efficiency. Rotor and stator forms are of reddish brown color molded bakelite, highly polished. Windings impregnated and securely held in place. Suitable for table or panel mounting. Binding post connections. Wavelength range, 180 to 650 meters; ¼-inch shaft. Shipping weight, 4 pounds. **$5.85**

63 J 6305

Molded Bakelite Variocoupler



Designed to match the above variometer in appearance and quality. Rotor and stator forms are of reddish brown color molded bakelite, highly polished. Suitable for table or panel mounting. Wavelength range, 180 to 650 meters, ¼-inch shaft. Six taps of one turn each, eight of six turns each. Shipping weight, 4 pounds. **$5.85**

63 J 6306

Molded Variometer

The stator and rotor forms of this variometer are molded of a special composition which can not warp or shrink and will retain its shape indefinitely. The windings are molded into the stator form and wound upon the rotor form in such a way that they can not come loose. Because of the materials used, this variometer produces maximum inductance with minimum distributed capacity. A very important point in the design is the clearance spacing between the rotor and stator. Many careful experiments were conducted to determine the correct spacing, with the result that the spacing used gives greatest possible efficiency. A very handsome appearing instrument in polished black finish. Binding post connection. Wavelength range, 150 to 600 meters; 4¼ inches square by 1⅞ inches thick. Shaft threaded 5/32. Shipping weight, 4 pounds. **$4.45**

63 J 6310

63 J 6314—Panel mounting brackets. Ship. wt., 6 oz. Pair **.35**

63 J 6315—2⅞-inch diameter dial with knob threaded 5/32. Shipping weight, 6 ounces **.69¢**

63 J 6316—3⅞-inch diameter dial with knob. Shipping weight, 6 ounces **.89¢**

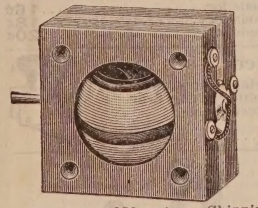
Molded Variocoupler

The rotor and stator forms of these variocouplers are of molded composition. A very high grade article, perfect in design and construction. Secondary is wound on the rotating element. Primary is wound on the stator and has five taps which may be connected to switch points and the inductance varied by means of an inductance switch. Windings are especially designed for short wave work from 150 to 600 meters. Brackets are provided, which makes it easy to fasten coupler to base or panel. Primary tapped for close tuning. Shaft threaded 5/32. Shipping weight, 3 pounds. **$4.45**

63 J 6311

63 J 6727—Molded dial and knob with 90° scale and 5/32 insert to fit coupler shafts. Shipping weight, 6 ounces **.69¢**

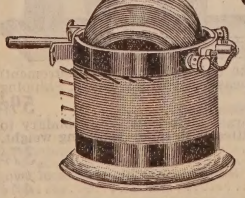
Our Special Wood Variometer



This is one of the finest looking and best made variometers. Equal in quality to any wood variometer made. The rotor and stator forms are made of solid genuine mahogany, finely finished and shellacked. Will not warp nor shrink. Designed for low dielectric losses and maximum range of inductance. Positive contacts eliminate possibility of scraping or frying due to poor connections. Rotor wire has green silk covering; ¼-inch shaft. Wavelength range, 180 to 650 meters. Shipping weight, 3 pounds. **$3.10**

63 J 6307

Our Special Variocoupler



Designed especially to match our special variometer. Fine looking. Very best quality. Stator tube and rotor ball molded bakelite. Both wound with green silk covered wire. Polished molded bakelite base for table mounting. Also arranged for panel mounting. Tapped primary for fine tuning. Positive contacts. Wavelength range, 180 to 650 meters; ¼-inch shaft. Shipping weight, 2½ pounds. **$3.10**

63 J 6308

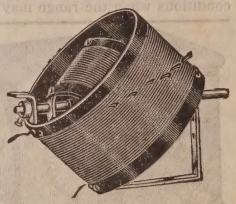
Does the Man in the Moon Talk to Your Little Folks?

"ONCE upon a time there was a giant—" "O-o-o",—says Little Brother, and he curls up in your lap and forgets to wriggle as he listens to a wondrous fairy tale. For the Man in the Moon is telling Little Brother his bedtime story—by radio.

In millions of homes, when supper is over and the lamps are lit, Little Brothers and Sisters are coaxed into their nighties by the same wondrous story that Little Brother hears. The Little Brother at Your House becomes one of these many happy little listeners when you own a radio outfit.

Almost every broadcasting station sends out, as the children's share of the evening's program, bedtime stories which are carefully chosen and charmingly told by people who know and understand children. Little folks from coast to coast have learned to love and look forward to this radio story hour.

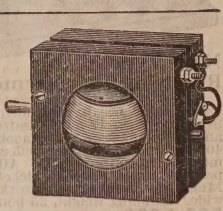
180° Variocoupler



This style coupler is preferred by many because of its high efficiency. Rotor and stator tubes are of genuine natural finish formica. Windings are impregnated to produce lowest distributed capacity. The soldered cable connections eliminate scraping contacts. For panel or table mounting; ¼-inch shaft. Wavelength range, 175 to 600 meters. Tapped primary for fine tuning. Shipping weight, 2½ pounds. **$3.25**

63 J 6309

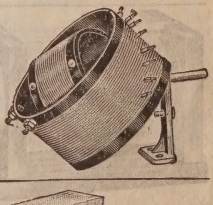
Wood Form Variometer



We offer this variometer at a very attractive price. While not equal to our special variometer in appearance, it will very nearly equal it or any other variometer in radio results. Wood forms of kiln dried wood. Rotor windings properly calculated for best results. Positive cable contacts. Binding post connections. Wavelength range, 180 to 600 meters; ¼-inch shaft. Ship. wt., 3 pounds. **$1.95**

63 J 5641

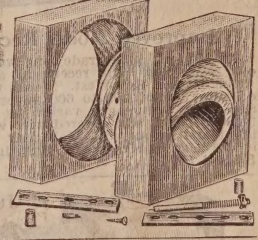
Wonder Variocoupler



This is one of the best values we know of. Especially designed to work with above variometer. A well made, efficiently designed instrument. Gives best of results; 180° coupling. Primary tapped for fine tuning. For table or panel mounting. Wavelength range, 180 to 550 meters. ¼-inch shaft. Shipping weight, 2 pounds. **$1.75**

63 J 6313

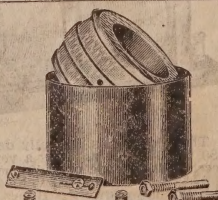
Variometer Parts



Consists of a complete set of parts for making a first class variometer. Set consists of two stator forms, one rotor, and the necessary metal shafts, bearings and screws to complete the instrument. No wire is included, so that you can arrange the windings to suit your own ideas. A wooden form for the stator windings is included. Coils are first wound on form and then slipped into the stator. Wood parts made of genuine solid mahogany. Ship. weight, 1½ pounds. **$1.35**

63 J 6322

Variocoupler Parts

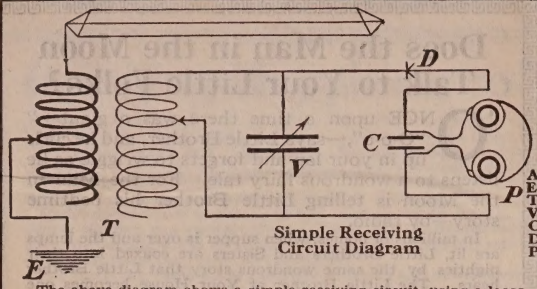


Includes all necessary parts except wire, to make a high grade variocoupler. Secondary is wound on the wooden rotor, primary is wound on an insulating tube and can be tapped at any point. Brass shafts, bearings and connecting screws finished ready to assemble. No wire included. Shipping weight, 1 pound. **$1.13**

63 J 6325

63 J 6326—Rotor ball only. Shipping weight, 6 ounces **.30¢**

63 J 6327—Stator tube only. Shipping weight, 6 ounces **.38¢**



Simple Receiving Circuit Diagram

A—Aerial
E—Ground
T—Tuner
V—Variable Condenser
C—Fixed Condenser
D—Detector
P—Receivers

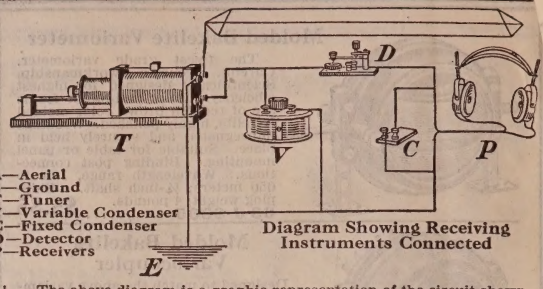
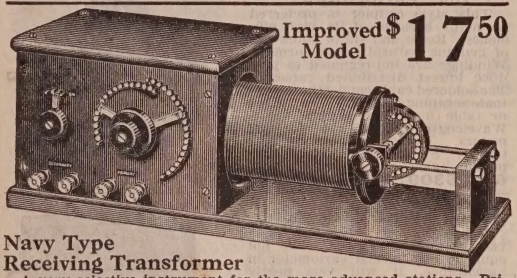


Diagram Showing Receiving Instruments Connected

The above diagram shows a simple receiving circuit, using a loose coupler and detector. This circuit has been used for many years and produces very satisfactory results with the instruments shown on this page. Amateur stations, radio broadcasting, regular commercial messages, long distance commercial messages, time signals, etc., are all easily tuned in. The range of such a set is not as great as the range of a vacuum tube receiving set, nor are the signals as loud. It is impossible to state exactly how far such a set will receive, as the range will depend upon atmospheric conditions. However, many amateurs are daily copying stations a hundred miles distant and it is not unusual to copy code stations 400 or 500 miles away. Satisfactory results on radiophone broadcasting with these types of instruments are limited to distances of 10 to 25 miles, except under favorable conditions when the range may be somewhat increased.

The above diagram is a graphic representation of the circuit shown in the diagram to the left and shows the instruments actually connected in the circuit. This circuit has been extensively tried out under varying conditions and has given good results. It must be understood, however, that there are many other ways of connecting up receiving instruments that give equally good results. The instruction books listed on Page 45 give complete information covering various types of circuits and results to be obtained under varying conditions.

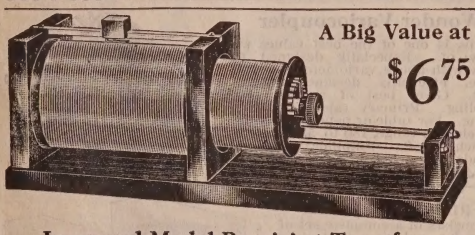


Improved Model $17.50

Navy Type Receiving Transformer

A very selective instrument for the more advanced stations. Primary inductance is controlled in steps by units and tens switches. Secondary has 12-point control. Perfect workmanship on switches and points makes a very smooth acting switch. Has wave range up to 4000 meters and is very effective on short wave lengths, 200 to 600 meters. Formica panels. All connections plainly marked. Metal parts of brass, polished nickel finish. Single silk covered windings. Mahogany finished woodwork. Base is 18 inches long, 6½ inches wide. Shipping weight, 25 pounds. **$17.50**

563 J 600

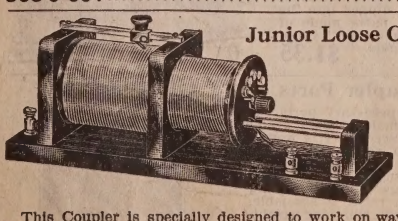


A Big Value at $6.75

Improved Model Receiving Transformer

An efficient, high grade long wave tuner. Has same winding as our Navy type. Will receive all government time stations such as Arlington and Key West. Works up to 4000 meters. Very effective on short waves, 200 to 600 meters. Primary controlled by slider. Secondary inductance varied by a 10-point switch mounted on formica panel, silk covered wire windings. Brass metal parts polished and lacquered. Mahogany finished woodwork. Base is 18 inches long, 6 inches wide. Shipping weight, 14 pounds. **$6.75**

563 J 601

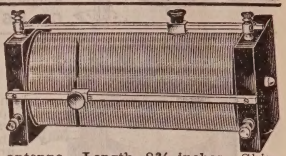


Junior Loose Coupler — $4.95

This Coupler is specially designed to work on wave lengths from 180 to 600 meters. It is a very efficient tuner and can be used to receive either code or radiophone signals. Although low in price, it is of high grade construction and finish throughout. Rubbed mahogany finish woodwork. Brass parts polished and lacquered. Base size, 12 by 3½ inches. Shipping weight, 6 pounds. **$4.95**

563 J 5103

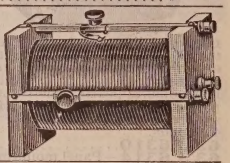
Two-Slide Radio Tuning Coil



Machine spaced enameled copper wire windings on non-shrinkable tube. Windings cannot come loose. Control is by means of two smooth working sliders. Mahogany finished endpieces. Range up to 1000 meters on average antenna. Length, 8¾ inches. Shipping weight, 4 pounds. **$2.65**

63 J 5104

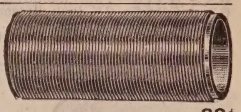
Beginner's Tuning Coil



For the beginner, this is a good working, low priced Coil. It will tune in amateur, broadcasting and commercial stations. Eight inches long. Wood ends, mahogany stained. Enameled wire. Two brass slider rods with sliders. Shipping weight, 4 pounds. **$1.78**

63 J 5106

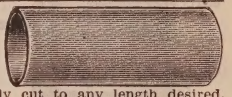
Wound Coils



With these Coils you can build your own tuner or loose coupler. Enamel wire wound on fiber tubes. Shipping weight, 2 pounds. **52¢**

63 J 6522—6 by 3 inches **63 J 6523**—8 by 3 inches... **76¢**
63 J 6524—8 by 3½ inches... **88¢**

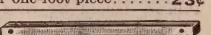
Cardboard Tubes



These Tubes are used for making tuning coils, loading coils, etc. They are made of specially prepared wood pulp and are treated so that they will hold their shape permanently. Easily cut to any length desired. Sizes given are outside measurements. Shipping weight, 1 pound.

63 J 6565—Diameter, 3 inches. Per one-foot piece..... **18¢**
63 J 6566—Diameter, 3½ inches. Per one-foot piece..... **21¢**
63 J 6567—Diameter, 4 inches. Per one-foot piece..... **23¢**

Slider Rods



Used for building up tuning coils. Made of solid brass, smooth, polished finish. Holes drilled in end. Rods are 3/16 inch square. Shipping weight of two rods, 6 ounces.

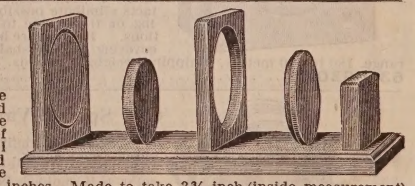
63 J 6575— 8 inches long. 2 rods for..... **16¢**
63 J 6576—10 inches long. 2 rods for..... **18¢**
63 J 6577—12 inches long. 2 rods for..... **20¢**

Slide Contacter

Slider for 1/16-inch rod. Stiff spring insures positive contact when slide is moved either forward or backward. Shipping weight, 3 ounces.

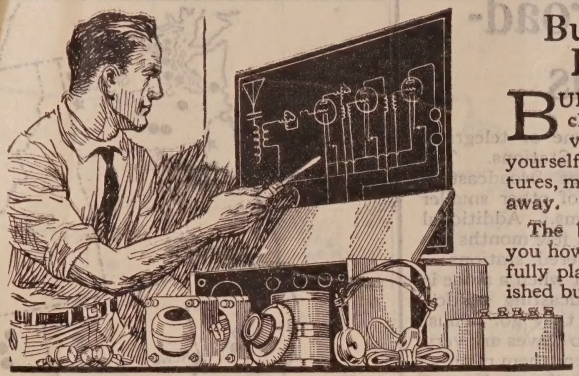
63 J 6532—Two for..... **18¢**

Wood Parts for Loose Coupler



Complete set of wood parts for loose coupler. Of best natural finish hard wood. Base size, 6 by 18 inches. Made to take 3¾-inch (inside measurement) primary tube and 3½-inch (inside measurement) secondary. Shipping weight, complete set, 6 pounds.

63 J 6585—Complete set, not assembled..... **59¢**
63 J 6586—Set of two round brass slide rods for secondary to slide upon, threaded on ends and fitted with nuts. Shipping weight, per set of two, 4 pounds. Per set of 2..... **37¢**
63 J 6589—Tubes for coupler. Shipping weight, per set of two, 1 pound. Per set of 2..... **44¢**



Build Your Own Radio Set From These Blueprints

BUILD your own Radio Set and you will get a clearer understanding of this wonderful new invention. Think of being able to make, all by yourself, an outfit, that will enable you to listen to lectures, music, opera, concerts—perhaps hundreds of miles away.

The blueprints and instructions offered will show you how to build your own set. They have been carefully planned and drawn up so that when you have finished building you will have a Radio Set of the latest design which works as well as the best commercial outfit. And, too, you will have the added satisfaction of knowing that you made it yourself.

Blueprints of Receiving Sets

These blueprints show in detail how to construct various types of receiving instruments. They give exact complete construction detail, of each part required and wiring diagram of connections.

How to Make 150 to 25,000 Meter Armstrong Regenerative Tuner

Designed for the experimenter who desires to cover the entire range of wavelengths now used by all classes of stations, and still secure maximum efficiency over the entire wavelength range. This uniform efficiency is obtained by using a specially designed switch which permits the proper adjustment of the capacity inductance ratio for maximum grid voltage, and eliminates losses in unused portions of the inductances. Regeneration is provided inductively on the lower wavelengths and conductively on the longer wavelengths. Shipping weight, per set, 3 pounds.

63 J 6330—Per set of 3 blueprints..... **$1.80**

How to Make 160 to 1,000 Meter Armstrong Improved Regenerative Tuner, Using Variable Condensers

Designed for amateur relay stations, being especially efficient on wavelengths from 160 to 400 meters, and giving approximately a regenerative amplification of 100 through the entire wavelength range. Receiver is free from body capacity effects even when receiving C. W. signals. Replaces the two-variometer tuners. Shipping weight, per set, 4 pounds.

63 J 6332—Per set of 4 blueprints..... **$2.40**

How to Make 150 to 3,000 Meter Armstrong Single Circuit Regenerative Tuner

This design has three distinct advantages over any single circuit receiver now made. First: The ratio of inductance to capacity is variable and can be adjusted for maximum results. Second: Variometers which are inefficient at their lower wavelength ranges are eliminated. Third: Combined inductive regeneration and tuned plate circuit is employed for maximum regenerative amplification. Shipping weight, per set, 2 pounds.

63 J 6334—Per set of 2 blueprints..... **$1.20**

How to Make Detector and Three-Stage Audio Frequency Amplifier

Designed especially for use with the 160 to 850 and 150 to 3,000 meter Armstrong regenerative receivers, and having all latest advantageous features. Provision is made to use a soft tube potentiometer, "B" battery adjustment, plate tuning circuit, filament ammeter; and the changes from one stage to any of the other stages is effected through a single switch, this switch also automatically controlling the filament circuits. The new Radio Corporation Amplifying Transformers are used, and insure maximum results. Shipping weight, per set, 4 pounds.

63 J 6337—Per set of 4 blueprints..... **$2.40**

How to Make 160 to 850 Meter Armstrong Super-Autodyne Receiver

This receiver, the very latest development in short wave reception, is used extensively by commercial radio stations to handle ship traffic. Used in connection with a small indoor loop antenna, it is possible to eliminate at least one-half of the total interference through the directive qualities of the loop. An additional advantage when using loop antenna is that maximum received energy is obtained from the desired station because of the directive feature of the loop. With this circuit it is possible to use resistance coupled amplification for short wave reception, and finally two stages of audio frequency amplification.

In laboratory tests, small powered 200 meter C. W. stations 500 to 1,000 miles away have been heard, not only loud enough to read, but readable five to ten feet from the phones. On 600 meters it is not unusual to hear a 2 K. W. ship station 1,500 to 2,000 miles distant. Shipping weight, per set, 4 pounds.

63 J 6336—Per set of 4 blueprints..... **$2.40**

How to Make Detector and Two-Stage Amplifier for Tuner 63 J 6336

The mechanical arrangement of this instrument is symmetrical to the above receiver and the electrical constants selected for best mutual relations. Change from detector to either step of amplification is obtained through plug and jacks. Provision is made to use a "soft" gaseous detector tube, but only using one "A" and one "B" battery, and the "B" potential applied to the detector tube is variable. Shipping weight, per set, 3 pounds.

63 J 6338—Per set of 3 blueprints..... **$1.80**

Twenty Radiophone Diagrams

A selection of diagrams and hook-ups which will help you to make up wireless telephone outfits from simplest detector circuit to the most modern regenerative and amplifying set. Consist of twenty blueprint diagrams, 8½ by 11½ inches, and one 4-page direction pamphlet containing illustrated Symbol Key Chart, directions of How to Read Diagrams, How to Follow Circuit, etc., and explanation of each diagram.

1—Single Slide Tuning Coil with Crystal Detector.
2—Double Slide Tuning Coil with Crystal Detector.
3—Loose Coupler with Crystal Detector.
4—Regenerative Set, using 2-slide Tuner.
5—Plain Audion Detector Circuit.
6—Feed-back Circuit with a Loose Coupler.
7—Armstrong Feed-back Circuit.
8—Standard Short Wave Regenerative Set.
9—Honeycomb Coil Receiver for all wavelengths.
10—Short wave Regenerative Set, with 2-step Amplifier.
11—Combination Circuit for Long and Short Waves.
12—Detector and 2-stage Amplifier with automatic Filament Control Jacks.
13—Single Circuit Regenerative Tuner.
14—Circuit for elimination of induction from power lines
15—Loop Aerial Receiver.
16—Radio and Audio frequency amplifier.
17—Circuit of a C. W. Transmitter for low power.
18—5-watt Radiophone Transmitter.
19—10-watt Phone and C. W. Transmitter.
20—High Power C. W. Transmitter.

Shipping weight, 2 pounds.

63 J 6348—20 diagrams..... **44¢**

Blueprints Showing How to Assemble Armstrong Super-Regenerative Receiver

The Armstrong super-regenerative circuit produces some very exceptional receiving results. The particular circuit selected for these blueprints is the three-tube type, which has proven one of the most satisfactory. Wiring diagram, panel and interior arrangement are shown clearly. In addition, complete data on construction of loop aerial and coupler are given. A detailed list of materials and hints on operation and construction are included. Shipping weight, per set, 2 pounds.

63 J 6345—Per set of 4 blueprints..... **$2.40**

Blueprints Showing How to Assemble 100 to 3,000 Meter Loop Antenna

Gives data and specification for construction of loop antenna to receive on wavelengths of 100 to 3,000 meters. Shipping weight, 2 pounds.

63 J 6346..... **60¢**

Blueprints Showing How to Assemble 1,000 to 25,000 Meter Loop Antenna

Gives data and specifications for construction of loop antenna to receive on wavelengths of 1,000 to 25,000 meters. Shipping weight, 2 pounds.

63 J 6347..... **60¢**

How to Make a Regenerative Tuner

Complete instructions with drawings on how to make a regenerative tuner with a range up to 800 meters. The type of tuner described has a .001 MFD variable condenser, a tapped inductance and a tickler coil. This type of set, because of simplicity of operation and good reception, is becoming very popular. Easy to build. All parts used are listed in this catalogue. Shipping weight, 4 ounces. **44¢**

63 J 6340.....

63 J 6342—Primary inductance tube for use with above set. Size, 4⅝ inches diameter by 5½ inches long. Ship. wt., 2 pounds. **35¢**

63 J 6343—Tickler tube. Size, 3 inches diameter, 2⅜ inches long. Shipping weight, 2 pounds..... **30¢**

63 J 6344—No. 23 green single silk covered wire for above set. Four ounces for..... **60¢**

63 J 6335—Brass bearings, with nuts to mount rotor shaft on inductance tube. Shipping weight, 1 ounce. Per pair..... **18¢**

How to Make Detector and Amplifier Units

Complete instructions with drawings These units are very similar in design to the units listed on Page 15. They are arranged so that they can be wired together to make a detector and two or three-stage amplifier. All materials required are listed in this catalogue. Shipping weight, 4 ounces. **44¢**

63 J 6341.....

Leading Radio Broadcasting Stations

THE central points from which radio telephone or telegraph messages are sent out are called Broadcasting Stations. The accompanying map shows the principal large broadcasting stations in operation today. There are hundreds of other smaller ones, some of them sending out very fine programs. Additional stations are being built constantly, so that within a few months the country will be intensively covered by high powered stations.

Radio messages, like waves on a still pond of water when a stone is dropped into it, travel outward from the broadcasting station in circles, diminishing in strength the farther out they go. Thus, within a radius of 50 miles of a station the radio waves are very strong, and you need only a simple receiving set to hear them plainly. But the farther you live from a broadcasting station, the weaker are the waves, and the more efficient must be your receiver to get them clearly. Beyond a radius of 200 miles only the more sensitive sets ordinarily will pick up messages.

Before ordering your outfit, consult this map. Figure out how far you are from a broadcasting station and select an outfit sensitive enough to hear it. Of course not every broadcasting station is listed here; new ones are being erected daily, and only the leading ones have been included. However, you will have no difficulty in finding out whether there is one nearer to your home and how sensitive an instrument you will need.

In the description of the radio instruments in this book we have tried to tell you how far they could be expected to pick up messages. But you must bear in mind that radio is very greatly affected by atmospheric conditions, and any instrument you buy will work better at some times than others. Radio messages always travel better at night than in the daytime, and they are heard farther and more clearly on a clear, crisp winter day than on a hot summer day. Then, too, local conditions have a marked effect. Some places are in a "shadow" or "pocket" for some stations, while they may be heard plainly from others. For example, it is usually difficult to send messages between Milwaukee and Chicago, while under the same conditions either of these stations can communicate with Detroit or Pittsburgh. The power of the transmitting or broadcasting station must be considered also, as some stations can send messages farther than others.

Wavelengths

Radio messages are sent out on different wavelengths. If a broadcasting station is sending out messages on a wavelength of 360 meters, in order to hear the message, your receiving set must be tuned to pick up 360-meter wavelengths. If it is tuned to a longer or shorter wavelength, you will be unable to hear your broadcasting station distinctly, if at all.

In order to avoid confusion and to keep the air clear from commercial or official messages, the United States government has reserved certain wavelengths for certain uses.

Amateur operators may send on 150 to 200-meter wavelengths; broadcasting stations usually send music or entertainment on 360-meter wavelengths, while market reports are generally sent out on 485-meter wavelengths.

Although amateurs are not allowed to transmit messages on wavelengths longer than 200 meters, they may listen in on any wavelength which their instrument is adjusted to receive.

The following list gives the leading broadcasting stations and their call letters:

City	Call Letters
st Pittsburg, Pa.	KDKA
lt Lake City, Utah	KDYL
An Diego, Calif.	KDYM
ortland, Oregon	KDYQ
reat Falls, Mont.	KDYS
Kalamath Falls Ore.	KDYU
Phoenix, Arizona	KDYW
Denver, Colo.	KDYY
Tucson, Arizona	KDZA
Aberdeen, Wash.	KNT
State College, N. M.	KOB
Los Angeles, Calif.	KOG
Reno, Nevada	KOJ
San Francisco, Calif.	KPO
St. Louis, Mo.	KSD
Seattle, Wash.	KTW
Chicago, Ill.	KYW
New Orleans, La.	WAAB
St. Paul, Minn.	WAAH
Wichita, Kansas	WAAP
Greenwich, Conn.	WAAQ
Omaha, Neb.	WAAW
El Dorado, Kansas	WAH
Minneapolis, Minn.	WBAH
Paterson, N. J.	WBAN
Decatur, Ill.	WBAO
Fort Worth, Texas	WBAP
Hamilton, Ohio	WBAU
Columbus, Ohio	WBAV
New York City, N. Y.	WBAY
Richmond, Va.	WBAZ
Anthony, Kansas	WBL
Chicago, Ill.	WBU
Springfield, Mass.	WBZ
Defiance, Ohio	WCAQ
Rapid City, S. D.	WCAT
Quincy, Ill.	WCAW
Detroit, Mich.	WCX
Tampa, Fla.	WDAE
Kansas City, Mo.	WDAF
Jacksonville, Fla.	WDAL
Chicago, Ill.	WDAP
Worcester, Mass.	WDAT
New York City, N. Y.	WDT
Roselle Park, N. J.	WDY
Atwood, Kansas	WEAD
St. Louis, Mo.	WEB
Montgomery, Ala.	WGH
Medford Hillside, Mass.	WGI
Chicago, Ill.	WMAQ
Buffalo, N. Y.	WGR
Schenectady, N. Y.	WGY
Madison, Wis.	WHA
Kansas City, Mo.	WHB
Rochester, N. Y.	WHQ
Newark, N. J.	WJZ
Indianapolis, Ind.	WLK
Cincinnati, Ohio	WLW
Auburn, Me.	WMB
Davenport, Iowa	WOC
Indianapolis, Ind.	WOH
Philadelphia, Pa.	WOO
Newark, N. J.	WOR
Jefferson City, Mo.	WOS
Memphis, Tenn.	WPO
Atlanta, Ga.	WSB
Paris, Texas	WTK
Detroit, Mich.	WWJ

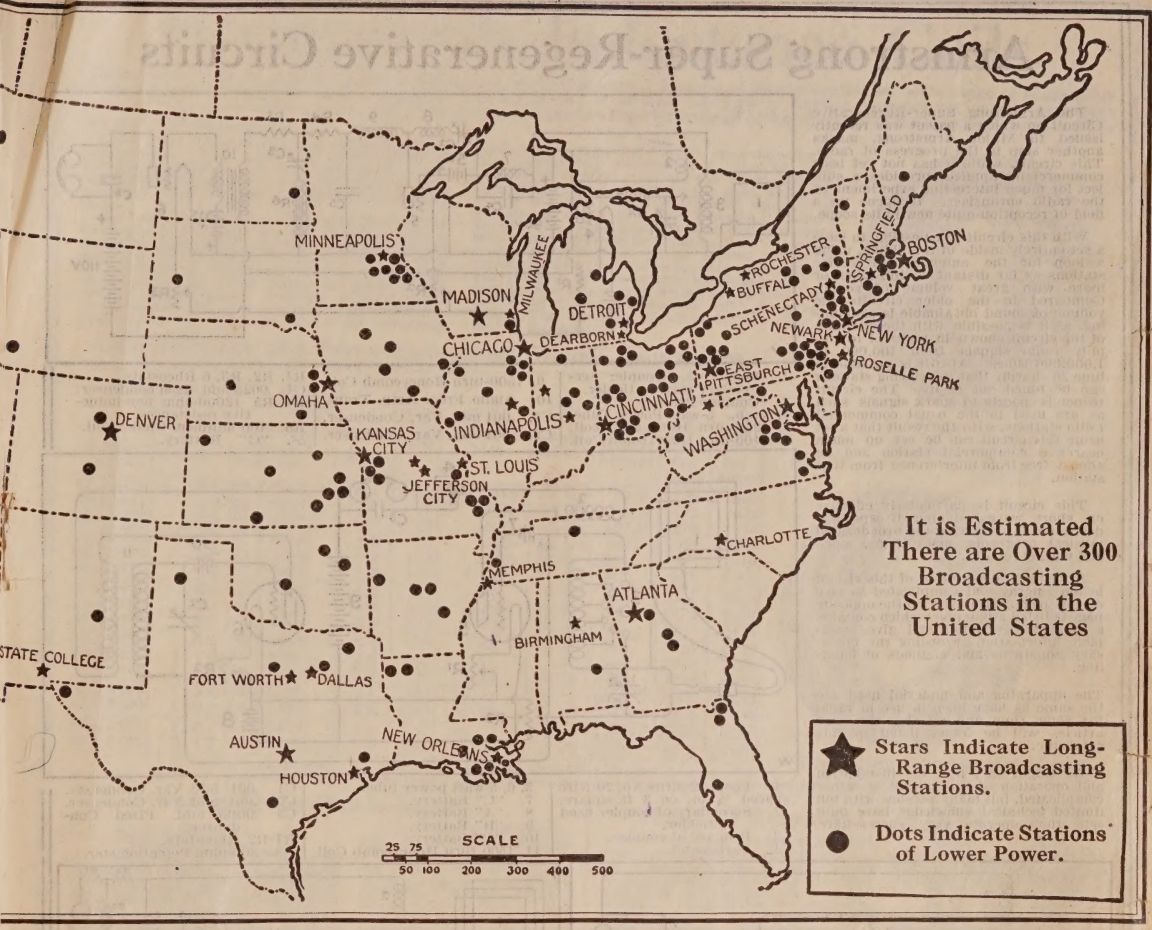
The Radio Outfit An Investment

"Wheat steady; corn down three; sharp break in hogs late today—don't ship." Dad drops the radio receiver with a bang, rushes to the door and shouts "Hi, Ed, don't load those hogs—we're going to hold 'em!" "Well," says he with a grin as he again takes up the receiver, "that information saved me about five times the cost of this radio outfit."

Dad has been listening to the daily market report on farm produce, broadcasted free by the State Agricultural College.

Many progressive State Universities are sending out this information by radio to farmers. Weather, crop and market reports—facts that are daily vital to the success of the farmers, should be the means of saving them thousands of dollars in a single season.

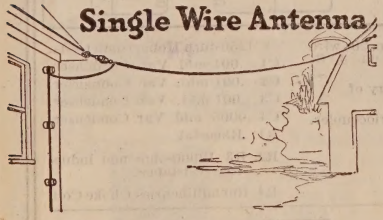
Your State University probably is sending out these reports. If you are not "listening in" on your radiophone, getting this information when it will be of the greatest benefit to you, you are letting dollars slip through your fingers. The original cost of your radio outfit may be more than saved in a day.



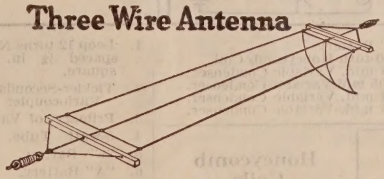
The Antenna or Aerial

The antenna or aerial is that part of the radio apparatus which collects the radio waves from the air. These waves are conducted to the receiving instrument through a wire called the "lead-in."

Single Wire Antenna



Three Wire Antenna



Some of the best results in receiving are obtained with a single wire antenna 75 to 125 feet long.

This type antenna will receive best when pointed toward the station from which the signals or speech desired is being sent out.

If limited space will not permit you to put up an antenna of 75 feet or more, construct your antenna with two or more wires strung parallel and spaced not less than two feet apart. A wooden stick can be used to separate the wire.

When properly constructed, the receiving antenna may be used also for transmitting messages. For this purpose an antenna consisting of from three to five wires from 60 to 85 feet long, is the most suitable. The antenna always should be clear of all objects and above them if possible. It should also be well insulated from its supports.

Indoor Antenna

An outdoor antenna is not absolutely necessary. A four or five wire antenna, from 35 to 50 feet long, strung inside the house often gives very good results. A compact type of aerial, known as the "loop antenna," has been very successful when used with the more sensitive instruments.

Any of the aerial wire we list (see Page 34) is satisfactory, but the seven strand cable, 63 J 5150, is the best.

Broadcasting stations already have been perfected to the stage where the programs they send out are received in a very realistic way. Much scientific research work is now being done to further perfect these stations and, in a comparatively short time, the quality of the programs sent out will be very near to perfection. Your present radio set will reproduce these perfectly transmitted programs just as they are sent out. The improvement will be in the transmission, not in reception, as the receiving apparatus made today will reproduce perfectly any radio program.

Armstrong Super-Regenerative Circuits

The Armstrong Super-Regenerative Circuit on which a patent was recently issued to Major Armstrong, marks another step in the progress of radio. This circuit, while it has not yet been commercially applied, provides a subject for much interesting experiment by the radio enthusiast. It opens up a field of reception quite new in its scope.

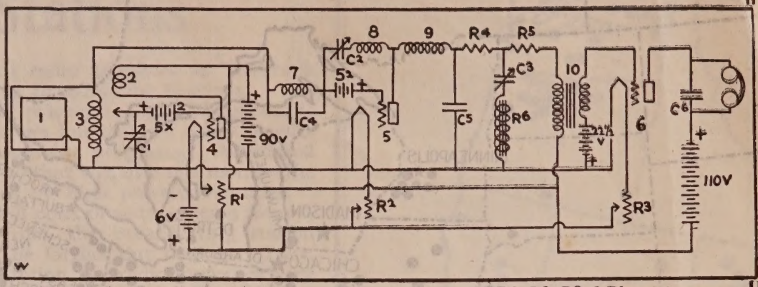
With this circuit it is possible to have a set entirely inside of a building, using a loop for the antenna, and receive stations as far distant as 100 miles or more with great volume of sound. Compared to the older circuits the volume of sound obtainable is astounding, as it is possible with the adaption of the circuit shown in Figure 1 to amplify radio signals from 100,000 to 1,000,000 times. Also it is possible to tune so sharply that interfering stations can be tuned out easily. The circuit responds poorly to spark signals such as are used in the usual commercial radio stations, with the result that a set using this circuit can be set up much nearer a commercial station and be almost free from interference from that station.

This circuit is particularly effective on short waves making it especially desirable for receiving the broadcasted musical programs, news items, stock and market reports.

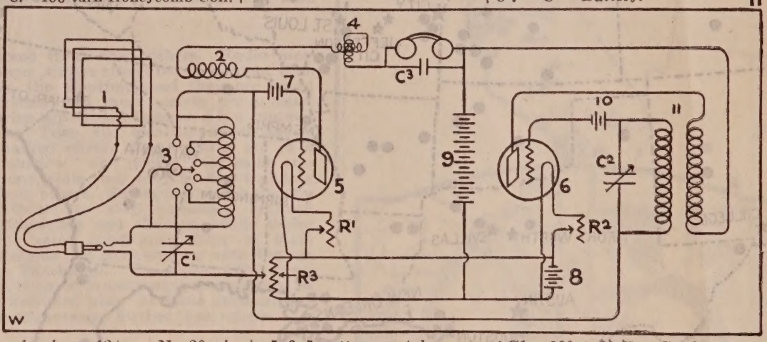
A technical description of this circuit is too lengthy and complicated to give on this page. However, on the opposite page is listed a pamphlet which contains a complete description and gives complete information regarding the necessary apparatus and methods of handling.

The apparatus and material used are the same as have been in use in radio for some time and all the necessary articles will be found listed in this catalogue.

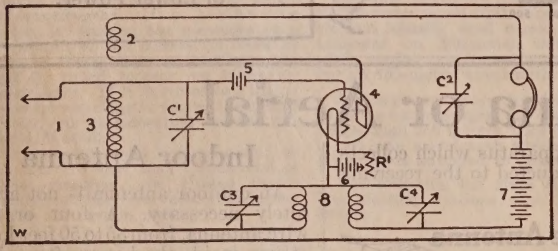
We might say, that the installation and operation of this circuit is rather complicated, but many persons with but limited technical knowledge have built sets that operate very successfully.



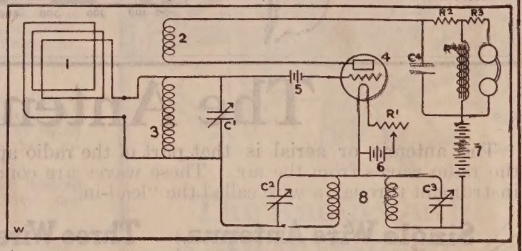
1. Loop. 2. Coupler Secondary used as tickler.
3. Coupler Primary.
4, 5, 6, 5-watt Power Tube.
7. 1250-turn Honeycomb coil.
8. 400-turn Honeycomb Coil.
9. 1500-turn Honeycomb Coil.
10. Audio Freq. Amp. Trans.
C1. .001 mfd. Var. Condenser.
C2. .001 mfd. Var. Condenser.
R1, R2, R3, 6 Rheostats.
C4. .0025 mfd. fixed condenser.
R4, R5 12000-ohm non-inductive resistances.
R6. 100 millihen. Choke Coil.
5². "C" Battery.



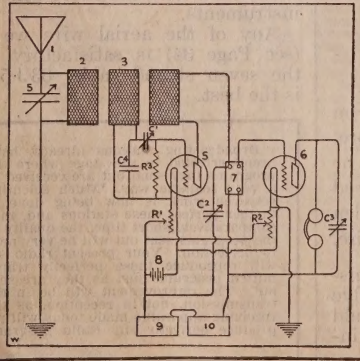
1. Loop, 12 turns No. 20 wire spaced ½ in. on 3 ft. square.
2. Secondary of coupler used as tickler.
3. Primary of coupler.
4. Variometer.
5, 6, 5-watt power tubes.
7. "C" Battery.
8. "A" Battery.
9. "B" Battery.
10. "C" Battery.
11. 1500 turn Honeycomb Coil.
C1 .001 mfd. Var. Condenser.
C2 .001 mfd. Var. Condenser.
C3 .0005 mfd. Fixed Condenser.
R1-R2 Rheostats.
R3 300-ohm Potentiometer.



1. Connection to Loop.
2. Tickler-Secondary of Coupler.
3. Coupler Primary.
4. 5-watt Tube.
5. "C" Battery.
6. "A" Battery.
7. "B" Battery.
8. 1250-turn Honeycomb Coil.
C1 .001 mfd. Variable Condenser.
C2 .0005 mfd. Variable Condenser.
C3 .001 mfd. Variable Condenser.
C4 .001 mfd. Variable Condenser.



1. Loop 12 turns No. 20 wire spaced ½ in. on 3 ft. square.
2. Tickler-Secondary of Variocoupler
3. Primary of Variocoupler.
4. 5-watt Tube.
5. "C" Battery.
6. "A" Battery.
7. "B" Battery.
8. 1250-turn Honeycomb Coils.
C1 .001 mfd. Var. Condenser.
C2 .001 mfd. Var. Condenser.
C3 .001 mfd. Var. Condenser.
C4 .0005 mfd. Var. Condenser.
R1 Rheostat
R2, R3 12000-ohm non inductive resistance.
R4 100 millihenries Choke Coil.

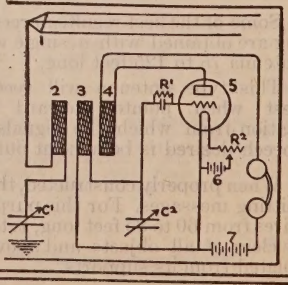


Honeycomb Coils

These Two Illustrations Show Honeycomb Coil in Radio Circuits

These two diagrams show Honeycomb Coils used in regenerative circuits. The diagram to the right shows the coils used in an audion detector circuit and shows the schematic wiring. The diagram to the left shows regenerative audion detector circuit with one stage of audio frequency amplification added and the different stages of the way audio frequency can be added.

Learn more about Radio. Read good books on this fascinating subject. See Page 45 for titles and descriptions of the most authoritative Radio Books.

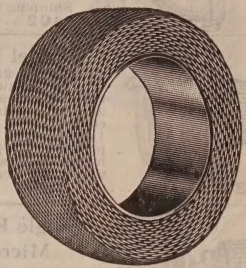


Honeycomb Inductance Coils

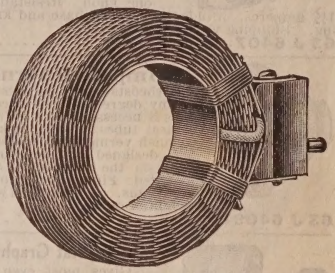
Honeycomb coils are used as receiving inductances, in various ways. Because of their compactness, wide range of adaptability and low price, every radio amateur should have a complete set. With them any style of straight, regenerative, super-regenerative or radio frequency hookup may be made, and results obtained are superior because of the efficiency of the coils and the concentration of the inductances.

These coils are compact and permit of easy manipulation. They cover the entire range of wavelengths without the dead end losses which exist when a tapped coil is used, and have low high frequency resistance and low distributed capacity losses.

The construction of the coil is such that successive turns of conductor are wound at an angle to preceding turns and spaced therefrom, which gives the coil the cellular structure from which it derives its name. These air cells and the angular disposition of the turns reduce the losses in the coil to a marked degree. With the proper condensers these coils will cover the entire range of wavelengths used in radio. By use of the mounting plugs and brackets listed below, these coils can be very conveniently attached to a panel or other support. The panel brackets are of two types—fixed and trunnion. The fixed is used where the coil is stationary, and the trunnion where it is desirable to rotate the coil for changing the degree of coupling, as between primary and secondary coils. Each coil, therefore, and its panel support is a separate unit which allows a great variety of arrangements to suit the ideas of the experimenter. For instance, the secondary inductance may be split up and a smaller coil used for coupling, and the secondary loaded by another coil to the proper value. The flexibility of these fixtures may be readily appreciated.



Unmounted Honeycomb Coil



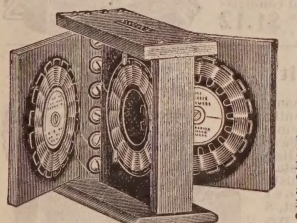
Mounted Honeycomb Coil

Characteristics and Prices—Honeycomb Wound Inductances

Unmounted Coils		Mounted Coils		Number Turns	Pure Inductance in MH.	Distrib. Capac. MM.F.	Natural Wavelength Meters	Wavelength with .0001 Shunt Cap. Meters	Wavelength with .001 Shunt Cap. Meters
Article Number	Each	Article Number	Each						
63 J 5470	$ .39	63 J 5485	$ .94	25	.03781	26.80	60.0	133	370
63 J 5471	.42	63 J 5486	.97	35	.07810	30.82	92.5	192	532
63 J 5472	.49	63 J 5487	1.04	50	.1519	36.38	140.0	278	748
63 J 5473	.55	63 J 5488	1.10	75	.3160	28.55	179.	386	1062
63 J 5474	.59	63 J 5489	1.14	100	.5614	35.98	268.	527	1438
63 J 5475	.62	63 J 5490	1.17	150	1.2915	21.18	312.	771	2160
63 J 5476	.68	63 J 5491	1.23	200	2.219	18.80	385.	1004	2838
63 J 5483	.72	63 J 5492	1.27	250	3.450	22.76	528.	1272	3570
63 J 5477	.80	63 J 5493	1.35	300	6.792	18.72	672.	1739	5015
63 J 5478	.98	63 J 5494	1.53	400	9.00	17.21	742.	1990	5720
63 J 5484	1.10	63 J 5495	1.65	500	14.45	17.20	940.	2515	7220
63 J 5479	1.23	63 J 5496	1.78	600	24.18	19.10	1280.	3300	9380
63 J 5469	1.36	63 J 5497	1.91	750	32.31	18.19	1445.	3805	10880
68 J 5480	1.62	63 J 5498	2.17	1000	60.50	16.65	1700.	5200	14600
63 J 5481	1.87	63 J 5499	2.42	1250	96.18	15.41	2295.	6590	18730
63 J 5482	2.17	63 J 5500	2.72	1500	143.00	15.70	2825.	8040	22860

Shipping weight, each, 6 ounces to 3 pounds, according to size.

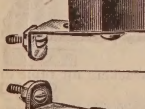
Turney Spider Web Inductance



A new form of inductance. May be used on wavelengths 180–400 meters. Adaptable to any style of hookup, with any of the crystal or vacuum tube detectors. Special instructions accompany each set, and with the hook-up given in instructions some remarkable results may be obtained. The three coils, one stationary, two movable—are mounted in wax finish golden oak cabinet. Close adjustment is attainable. Six binding posts mounted on formica strip for easy connection on any type circuit.

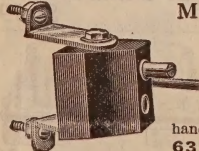
Shipping weight, 2 pounds.
63 J 6550 ..... **$4.45**

Fixed Panel Plug



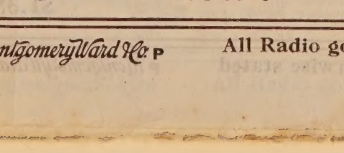
Used to mount any standard honeycomb type coil. By using tape, string or other suitable material, fiber strips attached to plug can be securely bound to coil. Carefully and accurately made. Shipping weight, 4 ounces.
63 J 6543 ..... **48¢**

Trunnion Panel Plug



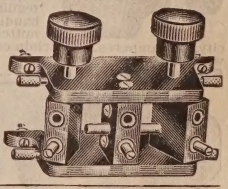
Fitted with brackets to mount on panel or other support. A well made plug, nicely finished. Will give accurate service. Made of molded bakelite. Takes any standard coil plug. Shipping weight, 4 ounces.
63 J 6545 ..... **55¢**

Molded Bakelite Coil Plug



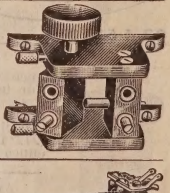
May be swung to any position desired. Used in making two or three-coil mounting with variable coupling. Complete with anti-capacity handle. Shipping weight, 6 ounces.
63 J 6548 ..... **83¢**

Triple Coil Mounting



For mounting three standard honeycomb coils of any size. Center mounting is stationary, two outside mountings are pivoted and adjusted by knob and shaft and may be locked at any position. Made of sheet bakelite with nickel finished metal parts. For panel mounting. Shipping weight, 2 pounds.
63 J 6537 ..... **$3.40**

Two Coil Mounting



For mounting two standard honeycomb coils of any size. One mounting is stationary, the other pivots and is adjusted by knob and shaft and may be locked in any position. Made of sheet bakelite with nickel finished metal parts. For panel mounting. Shipping weight, 2 pounds.
63 J 6538 ..... **$2.55**

Resistance and Choke Coils

Fine quality devices carefully and accurately made. Shipping weight, each, 8 ounces.

63 J 6552—Iron core choke coil, 100 millihenries ..... **98¢**

63 J 6553—Iron core choke coil, one henrie ..... **98¢**

63 J 6554—Open core choke coil, 10 millihenries ..... **89¢**

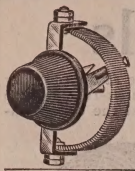
63 J 6555—Open core choke coil, 5 millihenries ..... **89¢**

63 J 6556—Wire wound non-inductive 12000-ohm resistance **$1.42**

63 J 6557—Molded non-inductive approximate 12000-ohm resistance ..... **45¢**

The New Armstrong Super-Regenerative Receiver

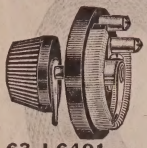
An illustrated pamphlet showing how to construct and operate this new receiver. A complete and careful detailed explanation of the theory and operation of the one, two and three-tube circuits, with a list of materials needed. Illustrated with diagrams and photographs. Shipping weight, 4 ounces.
63 J 6558 ..... **39¢**



Special Panel Mounting Rheostat

An exceptionally smooth working rheostat at a very attractive price. Permits delicate and accurate variations of the filament current. Can be mounted on any panel up to ⅜ inch thickness. Special grade of non-corrosive resistance wire wound on fiber support. Diameter, 1⅝ inches. Resistance 6 ohms. Capacity 1 ampere, complete with knob and pointer. Suitable for either amplifier or detector tubes. Shipping weight, 3 ounces.

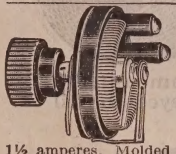
63 J 6402 ..... **38¢**



Panel Mounting Rheostat

Used to regulate filament current to detector or amplifier tubes. Smooth, even operation; no clicking. Neat appearing. Compact. Large attractive knob with pointer. Correct mechanical construction. Not affected by heat. Capacity, 1½ amperes. Resistance, 6 ohms. Mounts on panels up to ½ inch thick. Base diameter, 2⅛ inches. Screwholes, 1 inch centers. Shipping weight, 6 ounces.

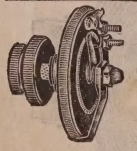
63 J 6401 ..... **48¢**



Single Knob Vernier Rheostat Micrometer Adjustment

Permits vernier adjustment at any point. With this rheostat better results are obtained using the critical tubes now on the market. Simple, quick, positive control of both main and vernier resistance, by only one knob. Resistance, 6 ohms. Capacity, 1½ amperes. Molded condensite base and knob. For panel mounting. Shipping weight, 8 ounces.

63 J 6407 ..... **$1.19**



Improved Vernier Rheostat

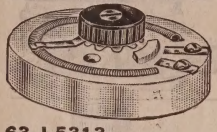
A rheostat which permits of finest vernier control at any degree of resistance of a battery current. This is necessary for best results with the modern critical tubes. Bakelite knobs engraved to distinguish vernier and coarse adjuster. One of the best designed and best constructed vernier rheostats on the market. Compact, rugged, easily mounted. Fiber base. Molded knob. Resistance, 6½ ohms. Capacity, 1½ amperes. Shipping weight, 4 ounces.

63 J 6409 ..... **$1.08**

Bradleystat Graphite Vernier Rheostat

Gives most even and finest control of filament current. Resistance is controlled by varying pressure on graphite and screw adjustment permits milliampere current regulation. Very ruggedly constructed. Will handle detector, amplifier or 5-watt transmitter tubes. Resistance, 15 ohms. Capacity, 2½ amperes. Porcelain case encloses graphite discs. Shipping weight, 1 pound.

63 J 6406 ..... **$1.58**



Porcelain Base Rheostat

A rugged rheostat for experimental work. Glazed white porcelain base. German silver resistance wire wound on fiber strip embedded in base. Smooth easy action. Molded knob. Resistance, 11 ohms. Capacity, 3 amperes. Diameter, 4 inches. Shipping weight, 1½ pounds.

63 J 5313 ..... **79¢**

Resistance Wire

A bare resistance wire selected for accuracy and uniformity. For use in electrical measuring instruments, rheostats, potentiometers, resistance coils, etc. Melting point, 1210° Centigrade (2200°F.). The current capacity given is for temperature rise of 100° C (212° F.) stretched in free air. Prices quoted are for 1-ounce spools. Shipping weight, per spool, 6 ounces.

Article Number	B & S Gauge Size	Current Capacity	Resistance per Foot	Per Spool
63 J 6446	20	3.50 amps.	.288 ohm	**24¢**
63 J 6447	22	2.50 amps.	.463 ohm	**27¢**
63 J 6448	24	1.80 amps.	.740 ohm	**29¢**
63 J 6449	34	.38 amp.	7.45 ohms	**45¢**

Amperite Current Adjuster

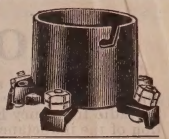
Vacuum tubes, to operate most efficiently and last the longest must have the filament at the proper temperature. To set an ordinary rheostat at just the right point with a varying battery voltage is difficult. Amperite regulates the current automatically. It will keep the filament current within eight one-hundredths of an ampere of highest point of efficiency. For use with amplifying tubes no rheostat is needed in conjunction with it. With a detector tube a rheostat is needed. Shipping weight, 2 ounces.

63 J 6410 ..... **95¢**

Metal Socket Shell

With this metal shell you can make your own socket. Right size to take any standard tube. Bayonet point groove catch. Well finished. Holes for fastening to bars with screws or rivets. Shipping weight, 2 ounces.

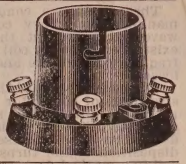
63 J 6422 ..... **29¢**



Bakelite Socket

Molded all in one piece of bakelite. A strong, compact socket. Takes any standard tube. Positive contact. A fine quality article at a very low price. Shipping weight, 3 ounces.

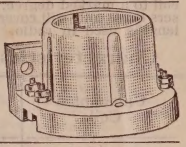
63 J 6430 ..... **22¢**



Best Grade Bakelite Socket

A fine quality molded one-piece bakelite socket. Reinforced at bayonet groove. Unbreakable with ordinary usage. Binding post connections. Positive contact springs. Neat and compact. Shipping weight, 4 ounces.

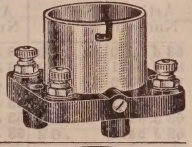
63 J 6432 ..... **32¢**



Porcelain V. T. Socket

Made entirely of glazed white porcelain. High dielectric strength. So rugged as to be practically unbreakable. Positive contact. Easily mounted on panel or base. For amplifier, detector or power tubes. Shipping weight, 8 ounces.

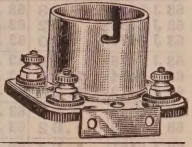
63 J 6419 ..... **36¢**



Standard V. T. Socket

A very popular type of socket. Metal tube, polished nickel finish. Inserted in molded bakelite base. Binding post connections plainly marked. Shipping weight, 5 ounces.

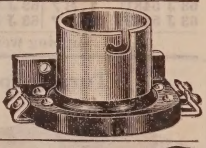
63 J 6434 ..... **69¢**



Combination V. T. Socket

A well made, finely finished socket for panel or table mounting. Metal tube and base, polished nickel finish. Conducting strips fiber insulated. Binding post connections plainly marked. Shipping weight, 6 ounces.

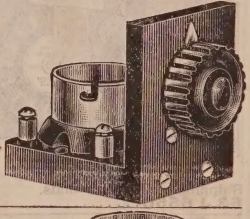
63 J 6435 ..... **39¢**



Combination V. T. Socket

Can be mounted directly on panel or fastened to base. Durable, rugged construction. Positive contacts. Easy connections plainly marked. Metal tube, polished nickel finish. Molded condensite base. Shipping weight, 6 oz.

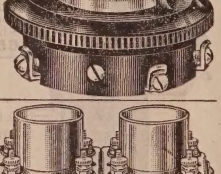
63 J 6417 ..... **$1.12**



Audion Control Unit

A rheostat and socket combined in one. Very conveniently arranged for panel or table mounting. Socket and rheostat have molded composition bases. High grade smooth working rheostat. Socket tube polished nickel finish. Plainly marked binding post connections. Shipping weight, 8 ounces.

63 J 6437 ..... **$1.89**



Socostat

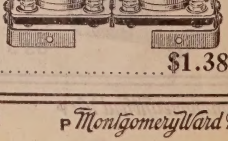
A combined single unit socket and rheostat for table or panel mounting. A novel article. Very compact. Makes very neat job in building up set. The usual rheostat being controlled by a disc which, for panel mounting extends through slot cut in panel. Easy connections, plainly marked. Shipping weight, 8 ounces.

63 J 6438 ..... **$2.23**

Three-Gang Socket

Three sockets as a single unit. Very convenient for making up detector two-stage amplifier. Permits a neat, compact job. Binding post connections. Brackets for table or panel mounting. Shipping weight, 8 ounces.

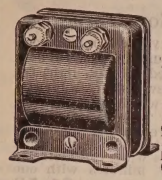
63 J 6424 ..... **$1.79**



Two-Gang Socket

Two sockets as a single unit. Very convenient for making up detector one-stage amplifier or two-stage amplifier units. Permits of a neat compact job. Binding post connections. Bracket for table or panel mounting. Ship. wt., 6 oz.

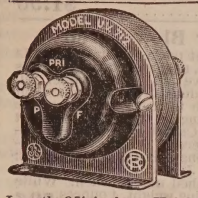
63 J 6423 ..... **$1.38**



Audio Frequency Amplifying Transformer

A well designed, carefully made transformer at an attractive price. Many of these transformers are in use and are giving very satisfactory results. Quality has in no way been sacrificed to make this unusually low price; we guarantee this transformer to be satisfactory in every respect. Enclosed in neat metal case. Binding post connections. Shipping weight, 1 pound.

63 J 6474.....**$2.70**

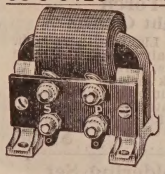


Audio Frequency Amplifying Transformer

Radio Corp. Model 712

This transformer was designed especially to work with UV-200 and UV-201 tubes. Its characteristics are such that it gives the better amplification with less disturbance, and losses are reduced to lowest possible minimum. Windings are encased within the laminated steel core. Ends are protected by stamped steel cover. Terminal posts are plainly marked. Net weight, 20½ ounces. Length, 3⅞ inches. Height, 2¾ inches. Base, 2 by 2¾ inches. Winding ratio, 9 to 1. Shipping weight, 1½ pounds.

63 J 6425.....**$7.00**



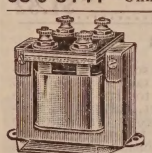
All American Amplifying Transformers

Designed with amplification and internal resistance constants to meet the requirements of Radiotron UV-201 and Cunningham C-301 tubes. Winding ratio of 10 to 1. Especially constructed to produce maximum amplification without distortion or howling. These transformers have given such satisfaction that they are standard equipment with many manufacturers of the higher grade instruments. Shipping weight, each, 1 pound.

63 J 6426—Mounted.....**$4.05**
63 J 6428—Unmounted.....**3.15**

Same high grade transformer, wound with 3 to 1 ratio, especially for use with A. P. Moorhead, Western Electric and similar tubes. Also desirable for 3rd and 4th stage of amplification when using Radiotron UV-201 or Cunningham C-301. Ship. weight, each, 1 pound.

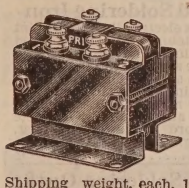
63 J 5140—Mounted.....**$3.85**
63 J 5141—Unmounted.....**2.95**



Thordarson Amplifying Transformer

A transformer of special merit, employing unusual construction features that serve to produce superior results with any standard tubes. Windings are of large size silk covered wire, greatly reducing the possibility of burnouts. Proper impedance is secured by use of extra large core of shell type. Winding ratio is 3½ to 1. Primary and secondary are wound to give most efficient coupling, with low distributed capacity. Howling is practically eliminated. Fully mounted with binding post connections. Shipping weight, 1 pound.

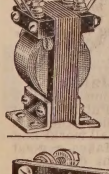
63 J 6427.....**$3.65**



National Amplifying Transformers

Designed especially for use with Radiotron UV-201 and Cunningham C-301 tubes. Winding ratio, 3½ to 1. This ratio has been found very satisfactory with these tubes. Shell type core gives maximum efficiency. Loss through leakage very low. Gives maximum amplification without howling. Enclosed in polished aluminum case with binding posts plainly marked. Low in price, but will give results equal to many selling at higher prices. Shipping weight, each, 1 pound.

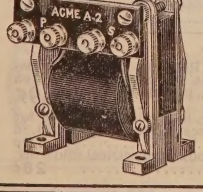
63 J.6420—Mounted.....**$3.70**
63 J 6421—Unmounted.....**2.98**



Federal Amplifying Transformer

The original amplification transformer. Its correct design and careful, perfect workmanship insure the best of results in any type of amplification circuit. It is especially compact. Winding ratio, 3 to 1. Audibility amplification is claimed to be 20 times on first step and 400 times on second step. Fully mounted. Shipping weight, 1 pound.

63 J 6429.....**$5.60**



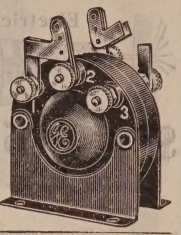
Acme Audio Frequency Amplifying Transformer

A transformer that leads through its merits. Combines realistic tone values and volume without howling or distortion. Because of its efficiency it will greatly increase the range of any receiving set. Especially desirable for use with loud speaking devices. Easily mounted. Marked binding post connections on bakelite panel. Guaranteed not to short or open circuit when properly used. Shipping weight, 1 pound.

63 J 6473.....**$4.38**

Radio Frequency Amplifying Transformer

Radio Corp. UV-1714



Range of 200 to 5000 meters. The high efficiency of this transformer will step up the strength of the incoming signals to a remarkable degree. By means of a special wiring arrangement, maximum efficiency is obtained from 200, to 500 meters as well as on longer wavelengths up to 5000 meters. Shipping weight, 1 pound.

63 J 6478.....**$6.50**

Radio Frequency Amplifying Transformer

The development of radio frequency amplification will be the next great step forward in the progress of radio. The transformer used will determine very largely the success obtained with most radio frequency hookups. The transformer we are offering here is the result of a long series of experiments combined with very careful, thorough engineering. It is of the air core type, the windings being in pancake style. This transformer will give very satisfactory results on a wavelength band from 180 to 500 meters. During tests conducted in Chicago using a hookup including one step of radio frequency amplification, a detector and two stages of audio frequency amplification, amateur C. W. voice stations along the Atlantic coast have been heard with an ordinary one-wire antenna. We do not claim such results are possible under all conditions, but merely cite this as an example of what has been done, using this transformer in circuit with other standard apparatus. Also, very long ranges of reception are obtainable with indoor loop antennae. Windings enclosed in sealed case with convenient connections and supports for mounting. Shipping weight, 1 pound.

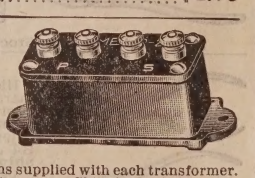
63 J 6639.....**$2.95**

Coto Coil Radio Frequency Amplifying Coil

Radio frequency amplification hookups are for two types—those using inductance transformers and those using amplifiers of the tapped impedance type. This instrument is of the latter type and produces some very wonderful results with the proper hookup. Remember that radio frequency amplification increases both the range and selectivity of a receiver. These units cover wavelengths from 180 to 750 meters. They can be mounted in tandem with a single control for all stages. Shipping weight, 10 ounces.

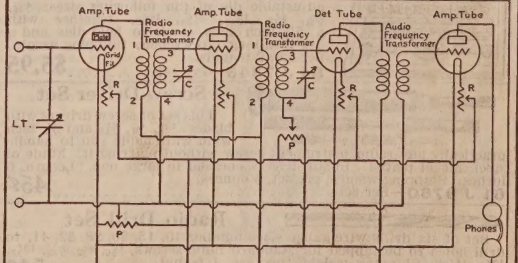
63 J 6637.....**$4.95**

Acme Radio Frequency Transformers



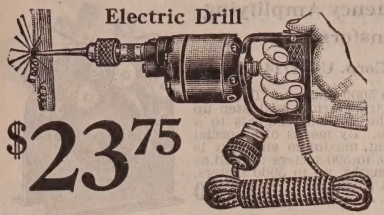
These transformers are used where a longer receiving range is desired or for use with indoor antennae. They were developed by a staff of the best engineers in the country and the result is the most advanced development in radio frequency transformers. Wiring diagrams supplied with each transformer. Iron core type. Mounted in bakelite cases. Shipping weight, each, 1 pound.

63 J 6475—Single stage transformer. Wavelength range, 100 to 350 meters for amateur reception.....**$4.38**
63 J 6476—First stage transformer. Wavelength range, 250 to 500 meters.....**$4.38**
63 J 6477—Second stage transformer. Wavelength range, 250 to 500 meters.....**$4.38**



This diagram shows a very satisfactory method of connecting our Transformer, 63 J 6639, using two stages of radio frequency, detector and one stage of audio frequency. Experience has proved that a hard tube (amplifier) gives better results with this circuit than a soft (radio detector) tube as the detector. The set made up as shown on this diagram can be used with an indoor aerial and will bring in signals often from distances as great as 100 miles. With an outdoor aerial, the range is greatly increased. In fact, 1000 mile records are common.

Electric Drill

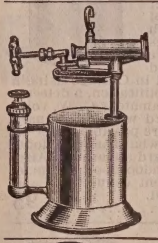


$23.75

Will save you much time and labor in your experimental work. It drills quickly clean cut holes in panels of any material. Will take drills up to ⅜ inch in diameter, which is large enough for all ordinary radio work. Fast working; high speed. Switch in handle to turn current on and off. Works on any house lighting current from 105 to 120 volts, either direct or alternating. Weighs only 4 pounds. Polished aluminum case; 6-foot cord with attaching plug. Very durable. Will last a lifetime with ordinary use. A very high grade drill that has given satisfactory service under continuous usage on light manufacturing work. This is the first time that a high grade drill of this kind has been offered at this low figure. Shipping weight, 6 pounds. **$23.75**

63 J 5825

Gasoline or Kerosene Blow Torch



A specially designed Torch which produces 400 degrees more heat than ordinary torches. New type burner of special composition bronze metal designed to burn low grades of gasoline and kerosene. Will operate successfully indoors or out. Produces a steady blue flame of intense heat on low fuel consumption. Tank of heavy seamless brass; bottom shaped to form funnel. Hook for soldering copper. One of the finest torches we ever offered our customers. Shipping weights: 3 and 4 pounds.

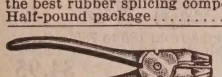
84 J 5220—1 pint. Height, 7 in. **$3.95**
84 J 5221—1 quart. Height, 9 in. **4.50**
Shipped from Stock in Portland, Ore.

Insulating Tape

For wrapping wires where insulation has been scraped off. In making joints on electric wires they must first be soldered, then wrapped with rubber splicing compound over which friction tape must be wound. Shipping weight, per package, 1 pound.

63 J 5848—Black Friction Tape, ¾ inch wide. A high grade tape. Half-pound package **22¢**
63 J 5854—Rubber Splicing Compound, ¾ inch wide. One of the best rubber splicing compounds on the market. Half-pound package **24¢**

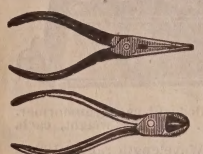
Side Cutting Pliers



Forged from the best quality steel. For linemen and electricians. Shipping weights: 4 and 10 ounces.

84 J 2203—6-inch **89¢**
7-inch **95¢**
Shipped from Stock in Portland, Ore.

Electricians' Pliers



High grade, 5½-inch, hardened steel sharp nose side cutting pliers. Used extensively on all electrical work. Handy around any workshop. Length, 5 inches. Shipping weight, 6 ounces. **90¢**

84 J 2165
Shipped from Stock in Portland, Ore.

Side cutting nipper. Best hardened tool steel, diagonal jaw. Length, 5 in. Shipping weight, 4 ounces. **$1.05**

84 J 2186
Shipped from Stock in Portland, Ore.

Radio Tap and Die Set

Standard sizes for radio instruments. Set includes one each, plug tap and round adjustable die of the following sizes: 5/36, 5/32, 3/32, 19/32, 1/24, 1/20, together with a 5⅛-inch long stock to hold dies and a 5⅜-inch long tap wrench. Shipping weight, per set, 2 pounds. **$5.95**

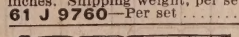
84 J 7348—Per set

Screw Driver Set

This set of screw drivers with blades 1/16, ⅛, 5/32 and ¼ inch wide will enable you to handle practically any radio instrument screw without marring it. Made of steel, nickel plated. Small drivers encased in large one. Length, 6 inches. Shipping weight, per set, 6 ounces. **45¢**

61 J 9760—Per set

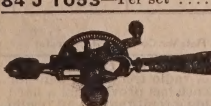
Radio Drill Set



Set of six drills wire gauge sizes number 10, 15, 20, 28, 32, 41, to drill holes to be tapped for standard radio screws, 4/36, 5/32, 5/32, 10/32, 12/24, 14/20. Shipping weight, per set, 1 pound. **54¢**

84 J 1053—Per set

Hand Drill



Goodell-Pratt hand drill, style 5½. One of the finest produced. Best for radio instrument construction. Double gears, two speeds, 3-jaw chuck. Capacity, 0 to ⅜ inch. Polished wood handle with space for drills. No drills included. Shipping weight, 3 pounds. **$4.45**

84 J 1298
Shipped from Stock in Portland, Ore.

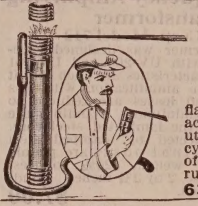
Automatic Blow Torch

$1.58

With this blow torch you can make neat, clean joints easily and quickly. Just fill both cylinders with denatured alcohol, light the large cylinder and in a few seconds a force is automatically generated which will produce a long, needlelike flame. This flame can be directed to the exact spot to be soldered and the heat confined to a very small space. Metal parts of brass, polished nickel finish; 5½ inches high, 2 inches wide; cylinders, ⅞ inch diameter. Will operate twenty minutes with one filling. Shipping weight, 6 ounces. **$1.58**

63 J 5876

Super Blow Torch



A handy vest pocket blow torch. Is clean, compact, neat and efficient. Gives instant, intensive and sootless flame. Fill cylinder with denatured alcohol, light wick and torch is ready for immediate use. By blowing on tube, a pointed, hot flame is obtained. Can be directed to the exact spot to be soldered. Burns twenty minutes with one filling. Height, 5¼ inches; cylinder diameter, ⅞ inch. Cylinder made of brass, fine polished nickel finish. White rubber tube. Shipping weight, 4 ounces. **79¢**

63 J 5877

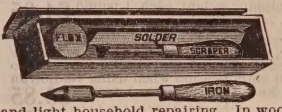
Baby Gasoline Torch

For Difficult Work in Tight Corners

The smallest practical Torch made. Lights with a match. Perfect and powerful. Burns without air pressure. Simple and automatic, with no movable parts, valves or pump to get out of order or be replaced. Tank height, 2⅝ inches; diameter, 1 13/16 inch. Requires no pumping and always is ready for use; simply hold a lighted match to the burner and it lights quickly. Will burn steadily for one hour on one filling of gasoline. Shipping weight, 5 ounces. **$1.58**

63 J 5860

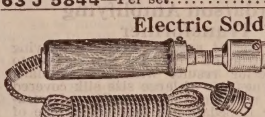
Soldering Set



A complete set for doing all ordinary small soldering. Consists of large soldering copper, bar of solder, powdered resin and directions. Suitable for electrical work and light household repairing. In wooden box. Shipping weight, per set, 1½ pounds. **$1.32**

63 J 5844—Per set

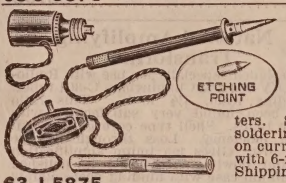
Electric Soldering Iron



An electric heated soldering iron. Attach it to any 105 to 120-volt house lighting socket, turn on the current and in two to three minutes iron will heat to proper temperature and maintain its even heat as long as current is left turned on. Suitable for general household use and light manufacturing work. Complete with 6-foot cord and attaching plug. Shipping weight, 2 pounds. **$5.85**

63 J 5873

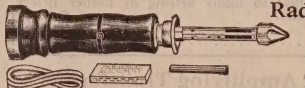
Combination Etcher and Soldering Iron



Has electrically heated point for etching radio panels and marking connections. Stylo paper supplied in silver, gold, green and red for marking letters. Soldering point included for soldering any radio connection. Used on current of any voltage. Complete with 6-foot cord and attaching plug. Shipping weight, 2 pounds. **$4.85**

63 J 5875

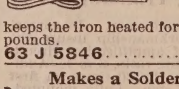
Radio Soldering Outfit



A complete soldering set, consisting of self heating soldering iron, solder and flux. Denatured alcohol is used for fuel and one filling, about two ounces, keeps the iron heated for about twenty minutes. Shipping weight, 2¼ pounds. **$1.78**

63 J 5846

Makes a Soldered Joint with Heat of a Match



Solderall is a paste combination of soldering metal and soldering flux. Put a drop of it on the joint to be soldered, heat the joint (one match is sufficient for small work) and the soldering is complete. Makes a good electrical and mechanical connection. In a convenient collapsible tube. Shipping weight, 2 ounces. **19¢**

63 J 5822

Wire Solder

63 J 5830—Resin core Wire Solder. Requires no flux. Indispensable for soldering electrical connections and extensively used on telephone and radio work. Shipping weight, pound, 1½ pounds. Per pound **69¢**

63 J 5831—Acid Core Wire Solder. Especially desirable for telephone connections. Net weight, 3 ounces. Shipping weight, 6 ounces. **19¢**

63 J 5832—Plain Wire Solder. Very handy for electrical soldering. Per pound **28¢**

Storage "A" Batteries

Ten Days' Trial in Your Own Home

When we entered the radio field, one of the first things we did was to get in contact with a manufacturer who could make a high grade Storage Battery for radio purposes. Our efforts were unusually successful. Not only are we offering a battery of the very best quality, but also our prices are right. They are lower than is being asked for many "A" batteries of inferior value. You need not hesitate to order from us, for you don't risk a cent. Try the battery for ten days in your own home. If it does not prove entirely satisfactory, write us for shipping instructions, and the purchase price, plus transportation charges, will be refunded promptly.

We offer only full size, honestly rated batteries that will deliver rated capacity and more. They are made of select new materials. We positively do not sell rebuilt batteries.

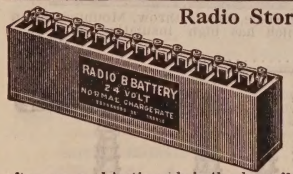
These batteries are especially designed to meet all conditions of radio. The plates are extra heavy so the battery will hold its charge for a long period of time and withstand sulphation when left in a partially discharged condition. This is a feature which adds greatly to the service you will obtain from these batteries. The case is made of fine, hard maple with dovetailed corners.

Rubber covered wire terminal leads with all brass wire connectors are provided so that connection wires will not be affected by acid fumes. Acidproof carrying handle makes it easy to move battery around. This is the most practical Radio battery on the market and is an exceptional value. Take advantage of our 10-Day Trial offer.

663 J 492—6-volt 40-ampere size. Shipping weight, 30 pounds..... **$10.95**
663 J 494—6-volt 80-ampere size. Shipping weight, 42 pounds..... **14.95**

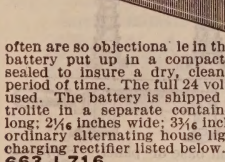
Shipped from Stock in Portland, Ore.

Radio Storage "B" Battery



A storage battery is more desirable than a dry cell battery for use in the "B" battery circuit, as the voltage will not vary perceptibly over a period of several hours' use. Also a storage battery is comparatively free from the many internal noises which often are so objectiona le in the dry cell "B" battery. This is a 12-cell battery put up in a compact unit rubber case, which is carefully sealed to insure a dry, clean exterior. Retains charge over a long period of time. The full 24 volts, or taps of two-volt variation, may be used. The battery is shipped to you fully charged, but with the electrolite in a separate container. Outside dimensions: 10$\frac{3}{16}$ inches long; 2$\frac{1}{16}$ inches wide; 3$\frac{3}{16}$ inches high. Can be easily recharged with ordinary alternating house lighting current by means of our battery charging rectifier listed below. Shipping weight, 7 pounds. **$8.75**

663 J 716.....



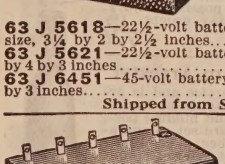
Vacuum Tube Plate Circuit Battery

The Audion "B" Battery

Our "B" batteries are made of the finest materials by one of the best battery makers. We guarantee them to equal in results any battery on the market. Fresh stock at all times. Very uniform and have extra long shelf life. Shipping weights: 2, 5 and 9 pounds.

63 J 5618—22½-volt battery. Signal corps standard size, 3¼ by 2 by 2½ inches..... **$1.10**
63 J 5621—22½-volt battery. Navy standard size, 6¼ by 4 by 3 inches..... **1.95**
63 J 6451—45-volt battery. Double Navy size, 6¼ by 6 by 3 inches..... **3.90**

Shipped from Stock in Portland, Ore.

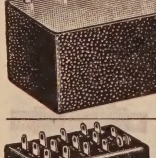


Tapped "B" Batteries

Shipping weights: 3 and 9 pounds.

63 J 6455—22½-volt, Navy size battery. Dimensions, 6¼ by 4 by 3 inches. Tapped to give 21, 19½, 18 and 16½ volts.... **$1.60**

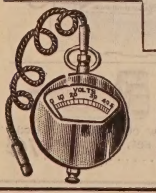
63 J 6457—45-volt, double Navy size battery. Dimensions, 6¼ by 4 by 6 inches. Tapped to give 45, 22½, 21, 19½, 18 and 16½ volts. **$3.20**



Hipwell "B" Battery

Refillable variable "B" Battery. Guaranteed noiseless. Because of its renewable, refillable feature, full service of the entire battery is assured. Can be tapped at any point, as each cell is fitted with an individual connection. Shipping weights: 2 and 5 pounds.

63 J 6459—22½-volt, 15-cell small battery; size, 2½ by 2¾ by 4¾ inches. **$1.70**
63 J 6461—22½-volt, 15-cell large battery; size, 2½ by 4¼ by 7 inches.. **2.45**



"B" Battery Meters

This is a special Voltmeter with a scale reading 0 to 50 volts. It will show the actual condition of your "B" battery. Tests 22½ or 45-volt batteries. Polished nickel case about the size of a watch; fitted with 8 inch connecting cord. Shipping weight, 5 ounces. **97¢**

63 J 6587.....

1½-Volt Unit Cells

These Units measure 1⅜ by 2¼ inches and can be used as renewals in any Navy size battery. They also fit the standard 1½-inch diameter flashlight cases. Shipping weight of three, 12 ounces. **39¢**

63 J 6465—3 cells for.....

Standard Dry Cell

Highest quality, standard size, 2½ by 6-inch Dry Cell. Initial test, 1½ volts, 25 to 30 amperes. Shipping weight, each, 3 pounds. **39¢**

63 J 2501—Each.....

Unit Dry Cell Battery

Consists of four regular size, 2½ by 6-inch dry cells, connected together and sealed in an airtight container. This method of construction greatly prolongs the life of battery. Binding post connections, handle for carrying; can be used as an "A" battery. Tests 6 volts, 22 to 30 amperes. Size, 10½ by 2¾ by 7 inches. Shipping weight, complete, 10 pounds. **$1.95**

463 J 418—Complete.....

4½-Volt "C" Battery and "B" Battery Unit

These Units may be used in making up "B" batteries. Five batteries connected making a standard 22½-volt battery, or four connected will produce eighteen volts, etc. Should one cell of the series go dead, it is only necessary to renew the block in which it is located and you again have a perfect working set of batteries. Cells are same size as used in Navy type batteries. Shipping weight, 1 pound. **37¢**

63 J 6463.....

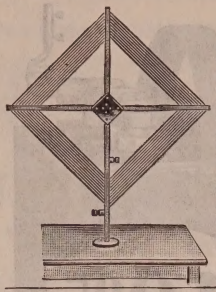
Charge Your Own Storage Battery with This Battery Charging Rectifier

This Rectifier, when connected with 110-volt 60-cycle alternating current, will supply a direct current for charging any type of storage battery. Just connect the attaching wire to any standard light socket and the rectifier charges the battery without further attention at a cost of a few cents. Suitable for charging radio or auto storage batteries. No chance to get connections wrong as charger automatically seeks its own polarity. Only one moving part which, with ordinary use, will last for years and can be replaced easily when necessary. Very compact. Size, 7 by 5¾ by 5¾ inches. Consists of a very efficient step-down transformer mounted in steel frame. From transformer, current passes through vibrating device which changes the alternating to direct current. Ampere meter registers charging rate. Prices includes 10-foot connecting cord with socket plug, battery leads, and two clips. Shipping weight, 10 pounds.

563 J 6193—Charges 6-volt battery at 7 ampere rate..... **$14.75**
563 J 6191—Charges 12-volt battery at 5 ampere rate..... **14.75**

Shipped from Stock in Portland, Ore.

Indoor Loop Antenna



This loop was designed to meet the requirements of those persons desiring to receive radio messages without the use of an outside aerial wire. Some circuits and instruments using a loop antenna for the aerial will, under favorable conditions, receive stations several hundred miles distant. Specially adapted for receiving up to 600 meters wavelength. Very sharp tuning can be obtained. Interference can be practically eliminated. Can also be used for direction finding. Comes knocked down complete with all necessary parts and wire. Directions for assembling and using included. Height, 44 inches. Shipping weight, 5 pounds.

63 J 651 ..... **$4.35**

Helix Antenna

A new device to be used in place of straight wire antenna. It can be put in a small space inside a room, or on the outside of a window, where space is limited. Excellent results have been obtained with it. Especially intended for use in receiving from nearby broadcasting stations. Not intended for receiving long distances, although stations more than a hundred miles distant have been tuned in with sensitive sets. Very efficient on 200 to 600 meter waves. Can be installed in space from 6 to 10 feet wide. Ship. wt., 3 lbs.

63 J 6248 ..... **$1.38**

Copper Antenna Wire

Supplied only in size coils listed.

63 J 5150—Aerial cable. Composed of stranded hard drawn copper wire. High tensile strength. Large surface area, giving low resistance and better results. Shipping weight, per 100 feet, 3 pounds.
100 feet, **69¢** 200 feet, **$1.36** 500 feet, **$3.25**

63 J 5151—Bare copper wire No. 14 gauge.
100 feet, **42¢** 500 feet, **1.70**

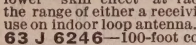
63 J 5152—Bare copper wire No. 12 gauge.
100 feet, **62¢** 500 feet, **2.65**

Copper Weld Antenna Wire

The ideal wire for radio aerials. Much stronger than ordinary copper wire. Made with a steel core onto which is welded an outer sheath of copper. Size No. 14. Shipping weight, 2 pounds. **42¢**

63 J 5154—100-foot coil .....

Braided Antenna Cable



This cable was specially developed for radio use. It is made of 16 flat strands of highest grade copper, braided into a hollow cable about ½ inch in circumference. This makes about twice the circumference of the ordinary antenna wire and the greater conducting surface offers a lower "skin effect" at radio frequency, which considerably increases the range of either a receiving or sending set. Especially desirable for use on indoor loop antenna. Shipping weight, per coil, 3 pounds. **$2.10**

63 J 6246—100-foot coil .....

New Code Rubber Covered Wire

Solid conductor copper wire, insulated with rubber compound over which is one cotton saturated braid. Shipping weights, per 100 feet, 3 and 13 pounds. Sold only in lengths listed.

63 J 3015—Size 14. 25 feet ..... **$ .25**
100 feet ..... **95¢** 500 feet **3.95**

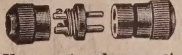
63 J 3036—Size 4. 10 feet ..... **.69**
25 feet ..... **$1.42** 100 feet **5.25**

New Code Twisted Pair Cotton Lamp Cord

Two conductor, twisted New Code lamp cord. Conductor consists of fine copper wire strands twisted together and insulated with rubber compound. Covering is of fine quality interwoven yellow and green cotton. Sold only in lengths listed. Shipping weight, per 100 feet, 6 pounds.

Article Number	Size	10 Feet	25 Feet	100 Feet	250 Feet
63 J 3175	18	22¢	48¢	$1.73	$3.70
63 J 3180	16	30¢	68¢	2.39	5.50
63 J 3185	14	42¢	97¢	3.60	8.50

Lamp Cord Connector



For quickly making or breaking connection between two lengths of lamp cord. Easily and quickly connected onto cord. Very neat and compact; conducting parts imbedded in molded composition. Shipping weight, 2 ounces. **32¢**

63 J 2694 .....

Antenna Wire Connector Block

If you have an antenna of more than one wire, you should connect the wires together with this connector block. Does away with soldering and loose connections. Made of solid brass. Shipping weight, 5 ounces. **22¢**

63 J 6604 .....

Iron Ground Rod

Length, 6 feet. Heavily galvanized. Necessary with every radio outfit to insure a perfect ground contact from lightning switch. Shipping weight, 4 pounds. **43¢**

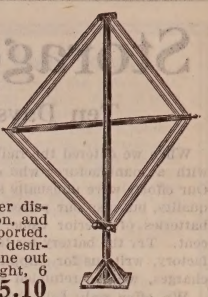
63 J 1081 .....

Ground Clamp

If you ground your outfit on a water pipe or steam pipe, you should use a ground clamp to insure a perfect connection. Adjustable to any size pipe up to 1½ inches in diameter. **9¢**

63 J 6606 .....

Box Type Loop Antenna



Differs from the one shown to the left in that the wires are all equidistant from the center. This type loop has given especially good results when used with tuners employing the super regenerative circuit. Very convenient and practical. Shipped knocked down. Can be easily assembled and taken down. Complete wood frame and stand with wire and binding post connections. Size of loop is two feet on each side. Modern radio frequency circuits and the super-regenerative circuits have opened a very broad field for indoor loop antennas. Reception over distances of from 200 to 300 miles is common, and many longer distance records have been reported. In congested localities loops are especially desirable, as it is possible to practically tune out most interfering stations. Shipping weight, 6 ounces. **$5.10**

63 J 653 .....

Electric Light Socket Antenna

Screw this device into any electric light socket and you can use it to replace the usual outdoor aerial. It is best for receiving from nearby stations and is not recommended for long distance reception. Simple to install; gives excellent results; absolutely safe. Shipping weight, 6 ounces. **$1.19**

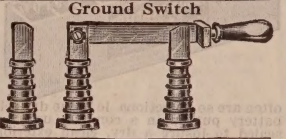
63 J 6605 .....

Ground Switch

A switch especially intended as an aerial grounding switch. The Underwriters' Standard 600 volt, 100 ampere. Single pole, double throw. Mounted on an asbestos composition base which has high insulating properties. Shipping weight, 5 pounds. **$2.85**

63 J 5359 .....

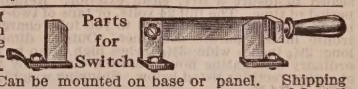
Ground Switch



Same type switch as above, except the separate parts are mounted on a high voltage insulation 3½ inches high. Insulators fitted with screw and washer at bottom so that switch may be mounted on any panel or base not over 1 inch thick. Ship. wt., 7 lbs. **$4.60**

63 J 6600 .....

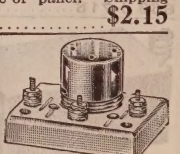
Parts for Switch



A complete set of parts—contacts, switch lever and handle of the above 600-volt 100-ampere switch. Supplied with screws. Can be mounted on base or panel. Shipping weight, 2 pounds. **$2.15**

63 J 6602 .....

Lightning Arrester



If you should neglect to throw your aerial switch to the ground contact when not using your instruments and an electrical storm should occur, serious injury might result to your apparatus. By installing one of these arresters in your antenna circuit above the ground switch, your instruments will be protected against possible injury. Mounted on a porcelain base. Shipping weight, 1½ pounds. **72¢**

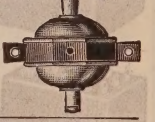
63 J 6608 .....

Brach Outdoor Type Vacuum Arrester

This arrester is built for outdoor service and is arranged so that it can be hung on the antenna or lead-in wire. It is fitted with a soldering lug and binding post. The safety gap points of this arrester are set comparatively far apart in a high vacuum chamber. Very sensitive to induction and static currents, yet will not permit leakage of radio currents. Approved by Fire Underwriters. Dependable. Shipping weight, 8 ounces. **$2.28**

63 J 6607 .....

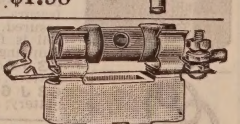
Outdoor Type Porcelain Enclosed Lightning Arrester



The safety gap points are set comparatively close together inside a porcelain protective cover. Very dependable and reliable. Convenient screw post connections. Can be suspended from lead-in wire or fastened to any support. Shipping weight, 2 pounds. **$1.58**

63 J 6611 .....

Brach Indoor Type Vacuum Arrester



This arrester must be mounted so that it is protected from moisture. Approved by Fire Underwriters. Will not permit leakage of radio currents. Shipping weight, 6 ounces. **$1.90**

63 J 6609 .....

Pipe Cap and Point

These two fittings may be attached to any galvanized iron pipe; ¾-inch iron pipe size. Pipe so fitted can be easily driven into the ground to insure good ground connection. Screw connection on cap for fastening ground wire. Shipping weight, per set, 2 pounds. **76¢**

63 J 6244—Per set .....

Especially Designed Insulators

WE are here introducing a new line of Insulators for radio purposes which were produced after careful study and experiments. The material used is the most satisfactory, moderately priced material for the purpose and has rubber as a base. Tough and durable. No shellac is used. Has a high melting point (360° F.) and the dielectric strength is very high. Not affected by acids, water or any ordinary atmospheric conditions. A particular feature of these insulators is that, with exception of 63 J 6616 and 63 J 6618, there is no metal whatever used in their construction. This makes for greater strength and better resistance of the weather.

Insulator for Small Aerial

Length over all, 4 inches. Flash over voltage, 35,000 volts. Shipping weight, 4 ounces. **6¢**

63 J 6610—Each

Round Insulator with Loops

A popular style of round insulator with metal loops for holding wire.

63 J 6616—Length, 3 inches. Tensile strength, 250 pounds. Flash over voltage, 28,000 volts. Shipping weight, 4 ounces..... **9¢**

63 J 6618—Length over all, 3¾ inches. Tensile strength, 350 pounds. Flash over voltage, 42,000 volts. Shipping weight, 4 oz. **14¢**

Popular Size Insulator

A rugged, solid type of insulator for longer aerials.

63 J 6612—Length over all, 5½ inches. Tensile strength, 350 pounds. Flash over voltage, 40,000 volts. Shipping weight, 8 ounces..... **36¢**

63 J 6614—Length over all, 8½ inches. Tensile strength, 1,000 pounds. Flash over voltage, 90,000 volts. Shipping weight, 1¼ pounds..... **66¢**

Air Gap Type Insulators

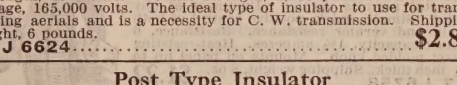
In this type insulator, air gaps have been interposed between live parts, thus imposing particular stress on the air and preventing any localized heating. This greatly builds up the electrical strength of the insulator and in thus preventing hot spots, eliminates possible mechanical failure.

63 J 6620—Length, 4 inches. Tensile strength, 750 pounds. Flash over voltage, 37,000 volts. Shipping weight, 1½ pounds.. **29¢**

Length, 7¾ inches. Tensile strength, 1,200 pounds. Flash over voltage, 72,000 volts. Shipping weight, 2½ pounds. **91¢**

63 J 6622.....

Aerial Insulator for C. W. Transmission

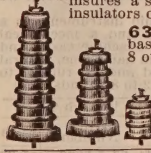


Length, 19 inches. Tensile strength, 1,200 pounds. Flash over voltage, 165,000 volts. The ideal type of insulator to use for transmitting aerials and is a necessity for C. W. transmission. Shipping weight, 6 pounds.

63 J 6624..... **$2.80**

Post Type Insulator

Used for supporting wires or other live conductors. Threaded inserts in top and bottom fitted with machine screws and washers. May be readily fastened to any panel base or instrument. Broad base insures a secure, stable mounting. Heights given are for insulators only and do not include screws.



63 J 6626—Height, 1⅝ inches. Diameter of base, 1½ inches; at top, 1 inch. Shipping weight, 8 ounces..... **48¢**

63 J 6628—Height, 3½ inches. Diameter of base, 1¾ inches; at top, 1⅛ inches. Shipping weight, 1 pound..... **76¢**

63 J 6630—Height, 5½ inches. Diameter of base, 2¼ inches; at top, 1¼ inches. Shipping weight, 2¼ pounds..... **$1.20**

Lead-in Bushing—Panel Insulator

63 J 6632—Especially designed for panel work. Length over all, 2⅝ inches; under shoulder, 1 inch; above shoulder, 1 ⅝ inches. Has ⅜-inch hole through center from end to end. Shipping weight, 8 ounces..... **58¢**

63 J 6634—Length over all, 5¼ inches; under shoulder, 2 inches; above shoulder, 1⅝ inches. Has rod through center projecting at ends. Threaded and fitted with nuts. Shipping weight, 1½ pounds. **90¢**

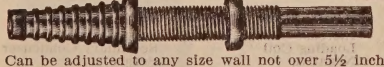
Window Sash Insulator

For bringing lead wires through window sash or wall. Length of insulation over all, 9 inches; under shoulder, 5½ inches; above shoulder, 3½ inches. Shipping weight, 3 pounds. **$1.35**

63 J 6636—With ⅜-inch hole in center from end to end.

63 J 6638—With rod projecting from end to end and threaded projection ¾ inch long at each end, fitted with nuts..... **$1.72**

Wall Insulators



Specially designed as a lead-in insulator for outside walls. Can be adjusted to any size wall not over 5½ inches thick. Length over all, 15½ inches; under shoulder, 10 inches; above shoulder, 5½ inches. Has ½-inch hole in center from end to end. Shipping weight, 4 pounds. **$2.10**

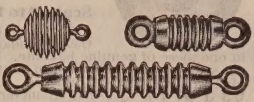
63 J 6640.....

Wall Insulator

Especially designed as a lead-in insulator for bringing in wires from the outside. Can be adjusted to any wall not over 12 inches thick. Length over all, 22 inches; under shoulder, 16½ inches; above shoulder, 5½ inches. Has ½-inch hole in center from end to end. Shipping weight, 6 pounds. **$3.40**

63 J 6642.....

Reliable Electrose Insulators



These insulators have been used for radio purposes a good many years. They are molded of shellac base composition which gives good service as an insulator. Have galvanized wrought iron eyes for attaching wires.

Article Number	Diameter	Length Over All	Strength	Electric Value		Each
				Dry Volt	Rain	
63 J 5630	2½ in.	3¼ in.	250 lbs.	40,000	25,000	26¢
63 J 5631	1½ in.	4 in.	1,000 lbs.	40,000	15,000	35¢
63 J 5632	1½ in.	10½ in.	1,000 lbs.	90,000	50,000	61¢

Porcelain Strain Insulators

A well made glazed finish porcelain insulator, strong and durable. Heavy ribs. Holes at each end for attaching wires. Very satisfactory for the ordinary receiving aerial. Size, about 2¾ inches long by 1¼ inches diameter. Shipping weight, each, 5 ounces. **7¢**

63 J 6643—Each..... Per dozen..... **76¢**

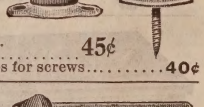
Leading-in Insulators

A new style insulator which is very desirable in many places because of its small diameter. It is only necessary to drill a ⅝-inch hole to insert the insulator. Can be used for bringing lead through a partition or wall. Made of molded hard rubber compound, possessing high insulating properties. Fitted with two nuts to hold insulator securely in place. Provided with connections. Shipping weights: 4 and 10 ounces.

63 J 6644—For 4-inch walls or smaller.... **49¢**

63 J 6645—For 9-inch walls or smaller.... **89¢**

Porcelain Brackets



These brackets are ideal for attaching aerial or ground wires to buildings or poles. Porcelain insulator is supported by U-bolt which greatly adds to strength. These brackets will stand a strain of 700 pounds straight pull. Metal parts sherardized, making the bracket rust-proof. Shipping weight, each, 1½ pounds. **45¢**

63 J 6646—With 2-inch screw.....

63 J 6647—With base having two holes for screws..... **40¢**

Porcelain Tubes

Unglazed porcelain tubes, 5/16 inch inside, ⅜ inch outside. Length given is from under head to end. Shipping weight, per dozen, 1 to 2 pounds.

63 J 3902—Length, 3 inches. Per dozen..... **10¢**

63 J 3906—Length, 6 inches. Per dozen..... **12¢**

63 J 3908—Length, 8 inches. Per dozen..... **20¢**

Glazed Porcelain Cleats

Take No. 10 or smaller insulated wires. Have 2½-inch wire centers. Shipping weight, per dozen pair, 3 pounds.

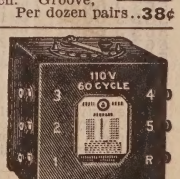
63 J 3920—2 wire cleats. Per dozen pairs..... **38¢**

Solid Porcelain Knobs

63 J 3927—New Code No. 5½ solid porcelain knob. Height, 1 3/16 inches. Diameter, 1⅛ inches. Hole, ¼ inch. Groove, 5/16 inch. Shipping weight, per dozen, 1½ pounds. Per dozen..... **28¢**

63 J 3929—No. 4 solid porcelain knob. Height, 1 1/16 inches. Diameter, 1½ inches. Hole, ⅜ inch. Groove, ⅜ inch. Shipping weight, per doz., 2 pounds. Per dozen pairs.. **38¢**

Standard Type Stepdown Transformer



Transforms 110-volt 60-cycle alternating current down to lower voltages. Windings sealed into steel cases. Connection post for obtaining different voltages. Fitted with 7 feet of cord and attaching plug.

63 J 1695—60-watt capacity produces from 2½ to 27½ volts in 2½-volt steps. Shipping weight, 4½ pounds. **$2.58**

63 J 1697—100-watt capacity produces from 1½ to 24 volts in steps of 1½ volts each. Shipping weight, 10 pounds..... **$4.70**

63 J 1699—150-watt capacity produces 1½ to 30 volts in steps of 1½ volts each. Shipping weight, 13 pounds..... **$5.95**

Radio Information

See Pages 48 and 49 for general information on radio which will be of much interest to you.

Build Your Set with Uniform Parts

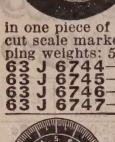
All the items shown here have neatly shaped ten sided knobs, molded of composition, with a highly polished black finish. Mounted on a panel, these articles present a uniform appearance that will greatly improve the looks of your set. All these articles are carefully designed and made of the best obtainable materials to give long and satisfactory service.

One-Piece Dials with Knobs

Scale, 0 to 100. Diameter, 3¼ and 4 Inches

These dials and knobs are, in our opinion, the best looking on the market. They are molded in one piece of genuine bakelite. Highly polished black finish. Clean cut scale marked 0 to 100, in contrasting glossy white enamel. Shipping weights: 5 and 7 ounces.

63 J 6744—3¼-inch diameter for 3/16-inch shaft..... **57¢**
63 J 6745—3¼-inch diameter for ¼-inch shaft..... **57¢**
63 J 6746—4-inch diameter for 3/16-inch shaft..... **77¢**
63 J 6747—4-inch diameter for ¼-inch shaft..... **77¢**



One-Piece Dials and Knobs

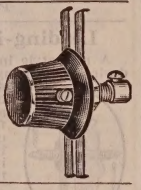
Scale, 0 to 10. Diameter, 2¼ Inches

Especially designed for rheostat and switch contact control. Makes your set more finished in appearance and definitely marks position of apparatus. Molded in one piece of genuine bakelite. Highly polished black finish. Clean cut scale marked 0 to 10 over 270 degrees. Shipping weight, each, 4 ounces.

63 J 6748—For 3/16-inch shaft..... **49¢**
63 J 6749—For ¼-inch shaft..... **49¢**

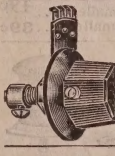
Series Parallel Switch

Well Made—Nicely Finished



Permits quick change from one circuit to another. Composition knob, polished black finish. Switch blades made of phosphor bronze, polished nickel finish. Radius of blades, 1¼ inches. Can be mounted on panels up to ⅜ inch thickness. Shipping weight, 4 ounces.

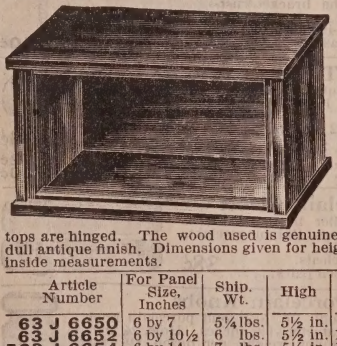
63 J 6751..... **59¢**



Dead End Switch

Used for dead ending unused portions of coils which produces greater efficiency. Four polished nickel finished arms are attached to bakelite strip. Ten sided molded knob, polished black finish. Can be mounted on panels up to ⅜ inch thick. Shipping weight, 8 ounces.

63 J 6752..... **59¢**



Wood Cabinets

The tendency in the radio field today is to put apparatus in cabinets—not only for appearance, but as a protection against dirt and atmospheric conditions. The cabinets we offer are attractive in design and are of uniform style so that you can use cabinets of different sizes and have them all match up. Panels are rabbeted into the front. Lids or tops are hinged. The wood used is genuine solid mahogany in fine dull antique finish. Dimensions given for height, width and depth are inside measurements.

Article Number	For Panel Size, Inches	Ship. Wt.	High	Wide	Deep	Each
63 J 6650	6 by 7	5¼ lbs.	5½ in.	6½ in.	7 in.	**$2.40**
63 J 6652	6 by 10½	6 lbs.	5½ in.	10 in.	7 in.	**2.69**
563 J 6654	6 by 14	7 lbs.	5½ in.	13½ in.	7 in.	**3.18**
563 J 6656	6 by 21	12 lbs.	5½ in.	20½ in.	7 in.	**3.80**
563 J 6658	7 by 9	6 lbs.	6½ in.	8½ in.	7 in.	**2.80**
563 J 6660	7 by 18	11¾ lbs.	6½ in.	17½ in.	7 in.	**3.90**
563 J 6662	9 by 14	10 lbs.	8½ in.	13½ in.	10 in.	**3.58**
563 J 6664	12 by 14	11 lbs.	11½ in.	13½ in.	10 in.	**4.25**
563 J 6666	12 by 21	13 lbs.	11½ in.	20½ in.	10 in.	**4.97**
563 J 6668	14 by 18	13 lbs.	13½ in.	17½ in.	10 in.	**4.97**

Panels

A new style of panel for radio work. Made of rubber base compound. Very attractive glossy black finish. Will retain its rich color indefinitely. Has higher dielectric strength than ever needed for panel work; strong, practically unbreakable. Drills nicely. Moisture proof. Thickness, 3/16 inch.

Article Number	Size	Shipping Weight	Each
63 J 6710	6 by 7 in.	2 pounds	**$ .53**
63 J 6711	6 by 10½ in.	3 pounds	**.79**
63 J 6712	6 by 14 in.	3½ pounds	**1.05**
63 J 6713	6 by 21 in.	4 pounds	**1.56**
63 J 6714	7 by 9 in.	3 pounds	**.79**
63 J 6715	7 by 18 in.	4 pounds	**1.56**
63 J 6716	9 by 14 in.	4 pounds	**1.56**
63 J 6717	12 by 14 in.	5 pounds	**2.07**
63 J 6718	12 by 21 in.	6 pounds	**3.06**
63 J 6719	14 by 18 in.	6 pounds	**3.06**

High Grade Switch Lever

Matches our uniform parts. Ten sided, molded knob, polished black finish; phosphor bronze contact lever, polished nickel finish. Radius, 1¼ inches. Can be mounted on any panel up to ⅜ inch thickness. Positive contact; smooth working. Shipping weight, 4 ounces.

63 J 6753..... **42¢**

Binding Posts

Large size, ten sided, molded bakelite knob, polished black finish; metal barrel, polished nickel finish; 5/8-inch long; 5/32 screw with washer. Finishes off panel when using other items in this set. Shipping weight, per dozen, 8 ounces.

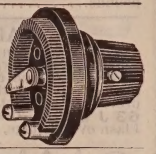
63 J 6754—Each **9¢** Dozen.... **97¢**

Bakelite Knobs

Ten sided, molded bakelite, polished black finish. Base, 15/16 inch; 5/16 inch high; shaft hole in center of bottom. Fitted with set screw. Shipping weight, each, 2 ounces.

63 J 6759—With 3/16-inch hole..... **18¢**
63 J 6756—With ¼-inch hole..... **18¢**

Vacuum Tube Control Rheostat



Used to regulate filament current to detector or amplifier tube. Heat-resisting base; molded ten sided knob, polished black finish. Mounts on panel up to ⅜ inch thick. Capacity, 1½ amperes; resistance, 6 ohms. Base diameter, 2 inches. Shipping weight, 6 ounces.

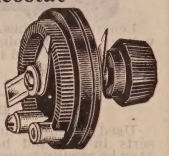
63 J 6757..... **78¢**

Potentiometer

Gives accurate, smooth, fine control. Mounts on any panel up to ⅜ inch thickness. Molded, ten sided knob, polished black finish. Resistance, 200 ohms. Shipping weight, 6 ounces.

63 J 6761..... **$1.22**

Vernier Rheostat



Best results are obtained when using a vernier rheostat with detector tubes. This rheostat permits vernier adjustment at any point. Simple, quick, positive control of both main and vernier resistance. Resistance, 6 ohms; capacity, 1½ amperes. Heat-resisting base; molded knob. Mounts on panel up to ¼ inch thick. Shipping weight, 8 oz.

63 J 6758..... **$1.22**

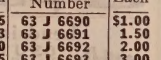
Radio Panels

We supply formica, bakelite or condensite celeron, whichever we have in stock.

These panels are standard for mounting radio instruments in a cabinet. They have a high dielectric strength and a mechanical strength far greater than will ever be needed. Machine easily and will not warp nor absorb moisture. Supplied in handsome, natural glossy black finish, which may be sandpapered and oil rubbed to produce a velvet satin finish. Shipping weights: 2 to 8 pounds.

Size	⅛ Inch Thick		3/16 Inch Thick		¼ Inch Thick	
	Article Number	Each	Article Number	Each	Article Number	Each
6 by 7	**63 J 6670**	$ .50	**63 J 6680**	$ .75	**63 J 6690**	$1.00
6 by 10½	**63 J 6671**	.75	**63 J 6681**	1.13	**63 J 6691**	1.50
6 by 14	**63 J 6672**	1.00	**63 J 6682**	1.50	**63 J 6692**	2.00
6 by 21	**63 J 6673**	1.50	**63 J 6683**	2.25	**63 J 6693**	3.00
7 by 9	**63 J 6674**	.75	**63 J 6684**	1.13	**63 J 6694**	1.50
7 by 18	**63 J 6675**	1.50	**63 J 6685**	2.25	**63 J 6695**	3.00
9 by 14	**63 J 6676**	1.50	**63 J 6686**	2.25	**63 J 6696**	3.00
12 by 14	**63 J 6677**	2.00	**63 J 6687**	3.00	**63 J 6697**	4.00
12 by 21	**63 J 6678**	3.00	**63 J 6688**	4.50	**63 J 6698**	6.00
14 by 18	**63 J 6679**	3.00	**63 J 6689**	4.50	**63 J 6699**	6.00

Radio Panel Plates



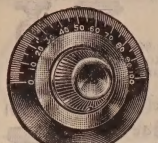
These panel plates will identify every connection. Made of brass with silver plated characters and border on black background. All plates are 1 by 3/8 inch, except the "On" and "Off" which are 5/8 by 3/8 inch; and the increase current, which are circular in shape and measure 1⅜ inches. Holes are pierced through plates so they can be fastened easily to panel. The blank plate listed may be lettered with pen or pencil as desired. **We do not sell less than one dozen.** Shipping weight, per dozen, 2 ounces.

Aerial	Increase Current (Right)	Receive
Antenna	Increase Current (Left)	Secondary
Audion	Loading Coil	Secondary Condenser
Audion Detector	Negative	Series
A Battery	Off	Telephone
B Battery	On	Tickler
Blank	Output	Transmit
Coupling	Parallel	Vacuum Tube
Detecto	Phones	1st Step
Detector Tube	Plate Variometer	2nd Step
Grid Variometer	Positive	3rd Step
Ground	Primary	
Input	Primary Condenser	

(Order by Article Number and state names wanted.)

63 J 6801—Per Dozen..... **35¢**

Bakelite Knob and Dial



A fine looking, one-piece molded knob and dial. Polished black finish; 180 degree scale marked 0 to 100 in contrasting white enamel. Will improve the appearance of your set. Knob offers convenient finger hold. Thin sheet walls. Light in weight. Very durable. Brass insert molded firmly into place; fitted with set screws. Diameter, 3 inches. Shipping weight, each, 3 ounces.

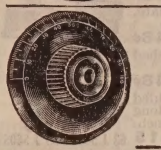
63 J 6734—For 3/16-inch shaft..... **29¢**
63 J 6735—For 1/4-inch shaft..... **29¢**

Molded Knob and Dial

This design knob and dial is very popular. It is molded from high grade polished black composition. The knob is securely attached to the dial by means of a brass bushing. Engraved scale marked from 0 to 100 in contrasting white enamel. Diameter, 2 1/16 inches. Shipping weight, each, 5 ounces. **29¢**

63 J 6736—For 3/16-inch shaft..... **29¢**
63 J 6737—For 1/4 -inch shaft..... **29¢**
63 J 6738—Knob only; 5/32 bushing. **15¢**

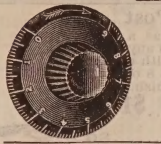
Hard Rubber Dial and Knob



Molded in one piece of polished black hard rubber. Finely engraved 180 degree scale in contrasting white enamel. Shipping weights: 5 and 7 ounces. **59¢**

63 J 6740—3-inch diam. for 3/16-in. shaft.
63 J 6741—3-inch diam. for 1/4-in. shaft **59¢**
63 J 6742—4-inch diam. for 3/16-in. shaft. **78¢**
63 J 6743—4-inch diam. for 1/4-in. shaft. **78¢**

Hard Rubber Knob and Dial



Finely engraved 270 degree scale in contrasting white enamel marked from 0 to 9. Desirable for use on rheostats and switch levers. Diameter, 2 1/4 inches. Exactly matches the above dials and knobs. Shipping weight, each, 4 ounces. **54¢**

63 J 6728—For 3/16-inch shaft.....
63 J 6729—For 1/4-inch shaft..... **54¢**

Tapered Hard Rubber Knob

This knob matches the above dials and knobs. The corrugated sides enable you to get a firm grip. Molded in one piece of polished black hard rubber. Can be used on rheostat, switch levers, etc. Height, 1 inch; diameter, 1 3/8 inches. Knobs for 3/16 and 1/4-inch shaft fitted with set screws. Shipping weight, each, 3 ounces. **15¢**

63 J 6706—To fit 3/16-inch shaft.....
63 J 6707—To fit 1/4-inch shaft..... **15¢**
63 J 6708—To fit 5/32 threaded shaft..... **15¢**

Molded Dial and Knob

Fine polished black finish. Beveled edges; radial lines and figures are sharply engraved and filled in with contrasting brilliant white enamel. Dial diameter, 3 inches. Shipping weight, each, 3 ounces. **45¢**

63 J 5563—Dial and knob for 3/16-in. shaft.
63 J 5564—Dial and knob for 1/4-in. shaft. **45¢**
63 J 5565—Knob only for 3/16-in. shaft.... **20¢**
63 J 5566—Knob only for 1/4-in. shaft..... **20¢**

New Style Dial and Knob

These dials and knobs are molded in one piece. They have a glossy black finish and are the most attractive looking on the market. Beveled edges. Finely engraved scale and figures filled in with contrasting brilliant white enamel, which stand out sharply and are easily read. The large and small dials match and combine well on a set. Shipping weights: 6 and 8 ounces.

2 7/8-Inch Diameter Dial and Knob

180 degree scale marked 0 to 100. **59¢**

63 J 6721—To take 1/4-inch shaft.....
63 J 6722—To take 3/16-inch shaft.... **59¢**
63 J 6723—To take 5/32 threaded shaft. **59¢**

3 7/8-Inch Diameter Dial and Knob

180 degree scale marked 0 to 100. **79¢**

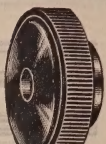
63 J 6731—To take 1/4-inch shaft.....
63 J 6732—To take 3/16-inch shaft..... **79¢**
63 J 6733—To take 5/32 threaded shaft.. **79¢**

Metal Knob and Dial with Vernier Adjustment

Fine tuning often demands that you turn your variometer or variocoupler the slightest degree. To make such a fine adjustment with the ordinary dial is almost impossible, but with this vernier knob and dial you can set your instrument to the finest possible degree of precision. Set consists of a 3-inch metal dial fitted with a knob of high grade molded composition. Has a finely engraved scale in contrasting white enamel. Beneath the dial is set the vernier adjustment which can be engaged or disengaged as desired. One complete revolution of adjustment will move large dial about 16 degrees. Dial and adjuster are set in a metal framework which amply protects the device. Dull black enamel finish. Shipping weight, each, 8 ounces. **$1.38**

63 J 6702—For 3/16-inch shaft.....
63 J 6703—For 1/4-inch shaft..... 1.38

Marconi Knobs



A knob suitable for large panels. Two sizes; match perfectly. Polished black finish. Has 3/16-inch hole at bottom, tapering to 7/16-inch at top. Shipping weights: each, 3 and 4 ounces; per dozen, 1 1/2 pounds.

63 J 5665—Diameter, 1 1/4 inches. **$ .87**
Each.....9¢ Dozen.....
63 J 5667—Diameter, 2 1/8 inches.
Each.....**21¢** Dozen..... **2.40**

New Government Style Knobs

Very neat appearing. Just the kind for highest class apparatus. Polished black finish. Brass threaded bushings, 5/32 or 19/32 insert in knob. Shipping weights: each, 3 ounces; per dozen, 1 pound.

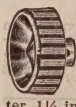
63 J 5701—Diameter, 1 inch. Fitted 5/32 bushing.
Each.....**8¢** Dozen..... **87¢**
63 J 5702—Diameter, 1 5/16 inches. Fitted with 5/32 bushing.
Each.....**12¢** Dozen.....
63 J 5669—Diameter, 1 inch. Fitted with 19/32 bushing. **$1.29**
Each.....**8¢** Dozen.....
63 J 5671—Diameter, 1 5/16 inches. Fitted with 19/32 bushing. **.87**
Each.....**12¢** Dozen..... **$1.29**

New Government Style Knobs—Hole for Shaft

Same style as above knobs. Look very attractive even on highest class apparatus. Polished black finish; 3/16-inch shaft hole. Top is countersunk for nut. Two holes in bottom for stay pins. Shipping weights, each, 3 ounces; per dozen, 1 pound.

63 J 5704—Diameter, 1 inch. Each..... **8¢**
Dozen..... **87¢**
63 J 5705—Diameter, 1 5/16 inches. Each.. **12¢** Dozen.. **$1.29**

Standard Knob



Polished black finish with fluted edges. Neat and attractive. Fitted with metal bushing tapped for 3/16-inch rod with set screw. Diameter, 1 1/4 inches. Shipping weights: each, 3 ounces; dozen, 1 1/4 pounds.

63 J 5675—Each..... **$ .20**
Dozen..... **2.25**

Regulation Style Knobs

Fluted edges. Polished black finish. Diameter, 1 1/2 inches. Fitted with 5/32 bushing. Shipping weights: each, 3 ounces; per dozen, 1 pound. **10¢**

63 J 5673—Each.....
Dozen.... **98¢**

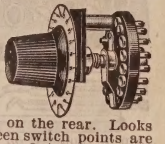
A knob used extensively on small panels, and small pieces of apparatus. Has 5/32 brass bushing. Diameter, 1 inch. Knurled edges. Polished black finish. Shipping weights: each, 3 ounces; per dozen, 1 pound. **$1.10**

63 J 5713—Each...**11¢** Dozen.....

A series of knobs matching each other, which may be used for various purposes such as binding posts, tops of detectors and tuning coil sliders. Polished black finish. Shipping weights: each, 3 ounces; per dozen, 1 pound. **32¢**

63 J 5715—Diameter, 15/32 inch. Fitted with 5/32 bushing.
Each.....**3¢** Dozen.....
63 J 5716—Diameter, 19/32 inch. Fitted with 5/32 bushing.
Each.....**4¢** Dozen.....
63 J 5717—Diameter, 11/16 inch. Fitted with 19/32 bushing. **35¢**
Each.....**5¢** Dozen..... **47¢**

Inductance Switch and Dial



This device does away with the usual awkward and unsightly set of switch and switch points on the panel. The switch points are mounted on an insulating block to which is attached a shaft that extends to a controlling dial and knob, so arranged that only the dial and knob are visible on the front side of the panel. The rest of the mechanism is mounted on the rear. Looks well, is perfect in design and construction. Fifteen switch points are provided, any number of which may be used. Silver finished dial, 2 1/4 inches diameter, with markings from 1 to 15 which indicate exact position of lever on switch points. Neat tapered knob molded of polished black composition. Requires but one hole to mount on panel. Shipping weight, 6 ounces. **$1.68**

63 J 6704.....

Metal Dials

Of heavy brass with silver plated numerals and graduation lines on polished black background. Deep beveled edges; etched scale 0 to 180 degrees on 3 1/2, 3 and 2 1/2-inch sizes; scale 0 to 280 degrees on 2-inch size. Fitted with high grade molded knobs. When properly grounded by means of contact spring, eliminates body or capacity effect. All sizes of these dials match each other perfectly. Shipping weights: 4 to 6 ounces.

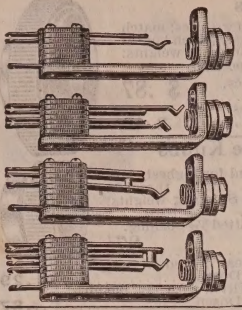
63 J 6921—Diameter, 3 1/2 inches for 3/16-inch shaft..... **38¢**
63 J 6922—Diameter, 3 1/2 inches for 1/4-inch shaft..... **38¢**
63 J 6923—Diameter, 3 inches for 3/16-inch shaft..... **35¢**
63 J 6924—Diameter, 3 inches for 1/4-inch shaft..... **35¢**
63 J 6925—Diameter, 2 1/2 inches for 3/16-inch shaft..... **31¢**
63 J 6926—Diameter, 2 1/2 inches for 1/4-inch shaft..... **31¢**
63 J 6927—Diameter, 2 inches for 3/16-inch shaft..... **26¢**

Vernier Adjuster

This little device can be mounted on the edge of any dial and will enable you to tune very close and sharp. Spring keeps adjuster pressure constant. Ship. wt., 3 ounces. **59¢**

63 J 6930.....

Radio Jacks



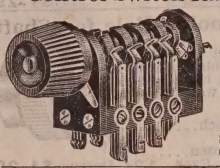
Well Made—Attractively Priced

Especially designed for radio work. Very compact, carefully constructed, finely finished. May be mounted on panels up to ⅛ inch in thickness. Contact points are silver. Shipping weight, each, 3 ounces.

State type wanted.

63 J 6780—Open circuit..48¢
63 J 6781—Closed circuit 56¢
63 J 6782—2 circuit.....68¢
63 J 6783—3 spring, single circuit. Filament control.....76¢
63 J 6784—5 spring, two circuit. Filament control.....84¢

Control Switch Radio Automatic Filament



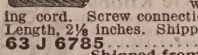
For Detector Two-Stage Amplifier

Replaces three filament control jacks and plugs. Phones or loud speaker hooked up to switch can be instantly put in circuit with either detector, first or second stage of amplification. Turns off filament current on tubes not being used. Furnished with knob and pointer, directions and blueprint of connections. Shipping weight, 1¼ pounds. **$3.95**
63 J 6798.....

Radio Plug

Especially designed for use in connection with above jacks. Large spaces for attaching cord. Screw connections. No soldering. Small and compact. Length, 2⅛ inches. Shipping weight, 3 ounces. 56¢
63 J 6785.....
Shipped from Stock in Portland, Oregon

Two Cord Radio Plug



Arranged to take 2 sets of phone cords. Connections easily and quickly made. Attractive looking round body. Shipping weight, 3 ounces. **$1.19**
63 J 6792.....

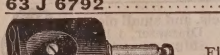
Universal Radio Plug

Fits any standard jack. Cords easy to connect. Shipping weight, 3 ounces. 78¢
63 J 6790.....

Radio Adapter Plug

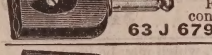
Black composition body. Fits any standard jack. Takes two standard plugs permitting use of one or two head sets as desired. Shipping weight, 4 ounces. **$1.26**
63 J 6791.....

Pacent Multijack



This simple device enables you to connect up three headsets with any receiving set, or two sets of phones and a loud speaker. Can be fastened in any convenient place. All standard plugs will fit it. Shipping weight, 4 ounces. **$1.26**
63 J 6794.....

Special Two-Circuit Jack

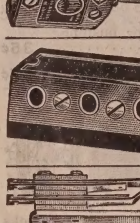


This well constructed, well finished two-circuit jack will give excellent service. Can be mounted on any panel up to ⅜ inch thick. Perfect contact; well insulated springs. Shipping weight, 3 ounces. 39¢
63 J 6787.....

Standard Radio Plug

This is a well designed plug intended especially for use with the above jack. Well finished fiber barrel which can be removed readily. Connecting cord can be soldered firmly to contact springs. Shipping weight, 3 ounces. 39¢
63 J 6788.....

Special Inductance Switches

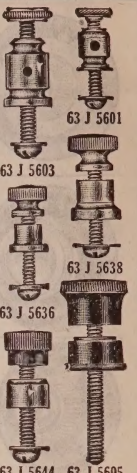


High grade, smooth working switches. Black polished composition knobs, nickel finished phosphor bronze spring and bushings. Panel bushing adjustable to any thickness up to 5/16 inch. Perfect contact. Shipping weight, each, 3 ounces.
63 J 6773—Radius, 1 inch.....23¢
63 J 6774—Radius, 1¼ inches.....23¢
63 J 6775—Radius, 1½ inches.....23¢

Single Pole Porcelain Base Knife Switch

Contacts and blades made of heavy copper. Satisfactory for antenna switches, although we recommend the switches listed on Page 34. Can also be used on other parts of apparatus. Shipping weights: 6 and 10 ounces.
63 J 2684—Single pole, single throw switch. Base size, 1¼ by 3¼ inches...18¢
63 J 2686—Single pole, double throw switch. Base size, 1⅜ by 3⅞ inches.....28¢

Binding Posts



Metal parts of brass. All have 5/8 inch long 6/32 screws with washers. Sizes given are from bottom of shoulder to top of knob, and do not include screw. Shipping weight, per dozen, 8 ounces.

63 J 5601—Length, 13/16 inch. Polished nickel finish.
Each.....8¢ Dozen.....84¢

63 J 5603—Length, 15/16 inch. Polished nickel finish.
Each.....10¢ Dozen.....98¢

63 J 5602—Length, 13/16 inch. Tumble plate, nickel finish.
Each.....4¢ Dozen.....36¢

63 J 5636—Length, 9/16 inch. Polished nickel finish.
Each.....8¢ Dozen.....84¢

63 J 5638—Length, 11/16 inch. Polished nickel finish.
Each.....10¢ Dozen.....98¢

63 J 5635—Length, 9/16 inch. Tumble plate, nickel finish.
Each.....5¢ Dozen.....48¢

63 J 5644—Length, 11/16 inch. With polished black molded knob. Polished nickel barrel.
Each.....6¢ Dozen.....48¢

63 J 5605—Large size polished black molded knob and base. Base molded onto 1 inch long 10/32 screw. Length of base and knob, 15/16 inch.
Each.....19¢ Dozen.....$2.15

63 J 5601 63 J 5603 63 J 5636 63 J 5638 63 J 5644 63 J 5605

New Style Binding Post

A specially constructed binding post. Has a non-removable knurled knob. May be mounted on any panel up to 5/16 inch thick. Made of brass. Fitted with copper lug and locknut. Shipping weight, 12 posts, 8 ounces.
63 J 5610—Hand buffed, polished nickel finish.
Each.....12¢ Per dozen.....$1.20
63 J 5613—Tumble plate, nickel finish.
Each.....8¢ Per dozen.....80

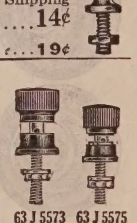
Switch Points

Made of brass. All have 5/8-inch screws or shanks threaded 6/32, and are fitted with two nuts. Shipping weight, per dozen, 4 ounces.
63 J 5650—¼ by ¼ head. Polished nickel finish. Per dozen.....36¢
63 J 5648—Head, ¼ inch diameter, ⅛ inch high. Polished nickel finish. Per dozen.....35¢
63 J 5649—Head, 3/16 inch diameter, 1/16 inch high. Polished nickel finish. Per dozen.....34¢
63 J 5652—Head, 3/16 inch diameter by ⅛ inch high. Nickel finish. Per dozen.....18¢

Switch Stops

Made of brass, polished nickel finish. Will fit any panel up to ⅜ inch thick. Supplied with one locknut. Shipping weight of four, 4 ounces. 14¢
63 J 5609—4 stops for.....
63 J 5611—Tumble plate, nickel finish. Per dozen.....19¢

Eby Binding Posts



A line of fine quality binding posts. Very neat; built for long service. Insure positive contact. The tops are non-removable. Shipping weight, each, 2 ounces.

63 J 5568—Captain—Large heavy binding post made of brass; hand buffed, polished nickel finish. Top has knurled finger hold band. Size of body, opened: 1⅛ inches high; ⅝ inch in diameter. Fitted with ⅜-inch screw and washer. Slot will accommodate No. 6 or smaller wire.....36¢

63 J 5569—Sergeant—Medium size binding post made of brass; hand buffed, polished nickel finish. Top has knurled finger hold band. Size opened: 13/16 inch high; ½ inch diameter. Fitted with 5/16-inch screw and washer. Will take size 10 wire or smaller.....16¢

63 J 5571—Buddie—A neat, small binding post. Same style of construction as the two described above. Made of brass; hand buffed, polished nickel finish. Height, ⅝ inch; diameter ⅜ inch. Will accommodate standard telephone cord tip and size 12 wire or smaller. Can be mounted on any panel not over ¼ inch thick. Fitted with one locknut.....11¢

63 J 5573—Commander "H"—A large size binding post with top and body of polished black molded composition. Height, 15/16 inch open; diameter, 9/16 inch. Fitted with ¾-inch long 8/32 screw, nut and washer. Will accommodate standard telephone cord tip and size 14 wire or smaller.....21¢

63 J 5575—Ensign "H"—Medium size binding post with top and body of polished black molded composition. Height, open, 13/16 inch; diameter, ½ inch. Will accommodate standard telephone tip and 14 wire or smaller. Fitted with ⅝ inch long 5/32 screw, nut and washer.....17¢

63 J 5573 63 J 5575 63 J 5568 63 J 5571 63 J 5569

Double Pole Porcelain Base Knife Switch

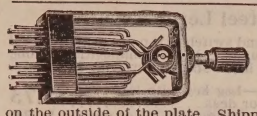
Contacts and blades made of heavy copper. Very satisfactory for antenna switches, although we recommend the switches listed on Page 34. Can also be used on other parts of apparatus. Shipping weights: 10 ounces and 1 pound.
63 J 2687—Double pole, single throw switch. Base size, 2 by 2⅝ inches.....39¢
63 J 2689—Double pole, double throw switch. Base size, 2⅝ by 4 inches.....45¢

Nickeled Finish Bezel

This little article is inserted in the tube observation hole, finishing it off nicely. Adds greatly to the attractiveness of your set. Rim made of brass, polished nickel finish. Nickel finished screen. Diameter, 1½ inches. Fits 1/8, 3/16 and ¼-inch panels. Shipping weight, 2 ounces.

63 J 6856.....**18¢**

Anti-Capacity Switch



Double throw, four pole, 12 spring standard switch key; 1⅝ inches wide; ⅞ inch deep. Entire length, 3⅛ inches. Arranged to mount on inside of panel. Only switch lever appears on the outside of the plate. Shipping weight, 8 ounces.

63 J 6796.....**$2.58**

Brass Strip—Three Sizes

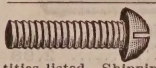
A necessity for radio construction. You should keep a few pieces of each size on hand. Width and thickness given are approximate. Shipping weights: 2, 4 and 6 ounces.

63 J 6857—For supports. Width, ½ inch; thickness, 1/16 inch; length, 24 inches. Per strip.....**19¢**

63 J 6858—For springs. Width, 5/16 inch; thickness, 1/32 inch; length, 24 inches. Per strip.....**16¢**

63 J 6859—For connections. Width, 3/16 inch; thickness, 1/64 inch; length, 24 inches. Per strip.....**14¢**

Machine Screws



Made of brass with slotted heads, accurately cut threads. Sold in even units only of quantities listed. Shipping weights: Per dozen, 2 ounces; per gross (144), 1 pound.

L'ngth	Size 6/32			Size 8/32			Size 10/32		
	Article No.	Per Doz.	Per Gross	Article No.	Per Doz.	Per Gross	Article No.	Per Doz	Per Gross
3/8 in.	63J6841	12¢	$ .96	63J6846	12¢	$ .96	63J6851	12¢	$ .96
½ in.	63J6842	12¢	.96	63J6847	12¢	.96	63J6852	12¢	.96
5/8 in.	63J6843	12¢	.96	63J6848	12¢	.96	63J6853	12¢	.96
¾ in.	63J6844	16¢	1.25	63J6849	16¢	1.25	63J6854	16¢	1.25
1 in.	63J6845	16¢	1.25	63J6850	16¢	1.25	63J6855	16¢	1.25

Brass Nuts for Machine Screws

Nuts to fit above machine screws. Sold in quantities listed only. Shipping weights: Per dozen, 2 ounces; per gross (144), 8 ounces.

63 J 6860—Size 6/32. 3 dozen....**20¢** Per gross (144)...**60¢**
63 J 6861—Size 8/32. 3 dozen....**24¢** Per gross (144)...**72¢**
63 J 6862—Size 10/32. 3 dozen....**28¢** Per gross (144)...**80¢**

Brass Washers for Machine Screws

Washers have hole sizes to fit machine screws of sizes given. Shipping weights: per dozen, 2 ounces; per gross (144), 8 ounces.

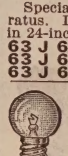
63 J 6865—Size 6/32. 3 dozen....**18¢** Per gross (144)...**48¢**
63 J 6866—Size 8/32. 3 dozen....**20¢** Per gross (144)...**54¢**
63 J 6867—Size 10/32. 3 dozen....**22¢** Per gross (144)...**60¢**

Tinned Copper Wire

Specially hard drawn tinned copper wire, for connections in apparatus. Its stiffness permits making a neat, efficient job. Supplied in 24-inch lengths only. Shipping weight of 3 pieces, 8 ounces.

63 J 6901—Size 12, square. 3 pieces.....**15¢**
63 J 6902—Size 12, round. 3 pieces.....**12¢**
63 J 6903—Size 14, round. 3 pieces.....**11¢**

Miniature Base Lamps



Light from batteries. Shipping weights of two, 2 and 4 ounces.

63 J 2307—3-volt. Lights on two dry cells. 2 lamps.....**26¢**

63 J 2313—6-volt. Lights on four dry cells. 2 lamps.....**26¢**

Porcelain Sockets for Miniature Base Lamps

May be fastened to any support. Two screws for wire connections. Takes lamps listed above. Shipping weight of three, 4 ounces.

63 J 2750—3 sockets.....**29¢**

Battery Connecting Clips

For connecting lead wires to storage battery terminals. Jaws open wide to attach to any size terminal. Made of steel, heavily lead coated. Perfect contact at all times. Length, 3¾ inches. Shipping weight of two, 8 ounces.

63 J 6197—2 clips.....**35¢**

Connecting Clips

Spring clip for attaching connecting wires to binding post, etc. Insure a firm, perfect contact. Brass, polished nickel finish. Shipping weight of three, 3 ounces.

63 J 6472—3 clips.....**31¢**

Small size clips. Right size for clipping onto small binding posts and screws. Nickel finish. Entire length, 1¼ inches. Jaws open about ¼ inch. Shipping weight, per dozen, 4 ounces.

63 J 6471—Per dozen.....**27¢**

Fahnstock Connectors

Very convenient for connecting wires. They may be fastened to binding post or wire. Connecting wire instantly attached to make a perfect electrical and mechanical connection by pushing down spring clip. Takes any size wire used in radio instruments. Shipping weight, per dozen, 3 ounces.

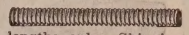
63 J 5607—Per dozen.....**25¢**

Solid Brass Rod

For shafts, etc. Supplied in 8-inch lengths only. Shipping weight of 3 lengths, 8 ounces.

63 J 6880—Size 6. 3 lengths.....**18¢**
63 J 6881—Size 8. 3 lengths.....**24¢**
63 J 6882—Size 10 (3/16 inch). 3 lengths.....**29¢**
63 J 6883—¼ inch. 3 lengths.....**35¢**
63 J 6884—5/16 inch. 3 lengths.....**45¢**

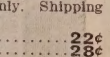
Threaded Brass Rod



Clean, accurate threads. Sold in 8-inch lengths only. Shipping weight of 3 lengths, 8 ounces.

63 J 6875—Size 6/32. 3 lengths.....**22¢**
63 J 6876—Size 8/32. 3 lengths.....**28¢**
63 J 6877—Size 10/32. 3 lengths.....**35¢**

Copper Lugs



Fit on machine screws. Intended to be clamped and soldered to connecting wire. Shipping weights: per dozen, 2 ounces; per gross (144), 6 ounces.

63 J 6892—Fit 6/32 screws. Per dozen, **11¢** Per gross (144) **.73¢**
63 J 6893—Fit 8/32 screws. Per dozen, **12¢** Per gross (144) **.76¢**
63 J 6894—Fit 10/32 screws. Per dozen, **13¢** Per gross (144) **.79¢**

Sheet Mica

Used as dielectric for condensers. Clear firm sheets. Shipping weight, per dozen sheets: 3, 4½, 6 and 8 ounces.

86 J 2569—2 by 3 inches. Per dozen sheets..... **$ .20**
86 J 2569—2½ by 4 inches. Per dozen sheets..... **.49**
86 J 2569—3 by 5 inches. Per dozen sheets..... **.89**
86 J 2569—5 by 7 inches. Per dozen sheets..... **2.79**

Varnished Cambric Tubing "Spaghetti"

Perfectly shaped tubing of high dielectric strength. Used to cover connecting wires in instruments. Insures proper insulation. Color, yellow. Shipping weight of 3 feet, 3 ounces.

63 J 6896—Size 3. Takes size 12 wire and smaller. 3 feet..**19¢**
63 J 6897—Size 2. Takes size 17 wire and smaller. 3 feet..**19¢**
63 J 6898—Size 1. Takes size 25 wire and smaller. 3 feet..**19¢**

Shipped from Stock in Saint Paul

Iron Setscrews

Size, 5/32. Shipping weight, per dozen, 2 ounces.

63 J 6887—¼ inch long. Per dozen.....**10¢**
63 J 6888—⅜ inch long. Per dozen.....**11¢**
63 J 6889—½ inch long. Per dozen.....**12¢**
63 J 6890— 1 inch long. Per dozen.....**13¢**

Tinfoil

Used for making condensers. In sheets, size 6½ by 8½ inches. Approximately 25 sheets to the pound.

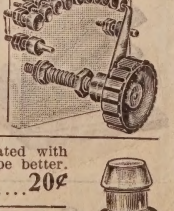
63 J 5680—Per pound.....**29¢**

Magnet Wire

For building radio apparatus, repairing motors, other electrical apparatus, experimental work. One piece only on a spool. Wire is standard B and S gauge. Insulation and wire both perfect and uniform. Supplied in weight spools given only.

Double Cotton Covered Magnet Wire 63 J 1350			Enameled Magnet Wire 63 J 1400	
8-Oz. Spool	1-Lb. Spool	Gauge	8-Oz. Spool	1-Lb. Spool
$ .45	$ .72	14	39¢	$ .65
.47	.78	16	41¢	.69
.51	.89	18	43¢	.72
.55	1.05	20	45¢	.77
.68	1.30	22	47¢	.82
.77	1.45	24	49¢	.90
.90	1.70	26	58¢	.92
1.05	1.99	28	62¢	1.15
1.60	2.60	30	65¢	1.20
1.95	3.40	32	70¢	1.25
2.80	4.95	36	98¢	1.80

Switch Lever Set



Consists of high grade switch lever with ten switch points and two switch stops fitted with nuts. They may be fitted to any panel up to ⅜ inch thick. Polished black knob; metal parts brass with visible parts polished nickel finish. Shipping weight, per set, 4 ounces.

63 J 5615—Per set.....**49¢**

Radio Shellac Compound

A heavy shellac compound used to coat radio parts. High insulating properties, penetrates pores of wood and prevents absorption of moisture. Dries quickly. Wood parts coated with this shellac look well and will hold their shape better. Shipping weight, 8 ounces.

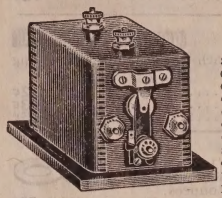
63 J 6763—2 ounces.....**20¢**

Insulating Varnish

Used to coat wire coils. Dries quickly and forms a stiff hard film which will keep the wire in shape and position. Free from capacity effects. Shipping weight, 8 ounces.

63 J 6762—2 ounces.....**20¢**

Spark Transmission Apparatus



Wireless Spark Coils

These coils are carefully constructed and operate successfully on either dry cells or storage batteries. The vibrator is of excellent construction and gives a clear, even tone. The necessary primary condenser is enclosed in the base and is of correct size for proper operation. Properly adjusted, the half-inch coil has a sending range of from 2 to 5 miles; the one-inch coil, 5 to 10 miles. Amateurs will appreciate the efficiency of this moderately priced spark coil. Shipping weights: 6 and 8 pounds.

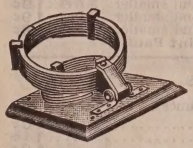
63 J 5126—Half-inch coil **$4.85**
63 J 5127—One-inch coil **6.48**

Spark Coil Transmitting Condenser

Designed for use with spark coil sets, dielectric of five 5 by 7 photo plates. Mahogany finished case. Permits working on 200 meter wave. Shipping weight, 3 pounds.

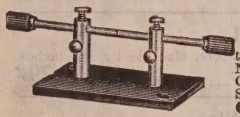
63 J 5348 ..... **$1.48**

Murdock Oscillation Transformer



Permits sharp tuning on 200 meter wave. Can be used on sets up to 1 K. W. primary and secondary windings of edgewise wound copper ribbon. Coupling varied by hinge. Ruggedly built to withstand hard, constant usage. Very efficient part for amateur sending stations. Shipping weight, 8 pounds.

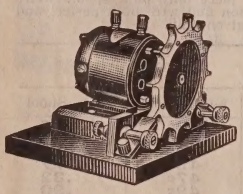
63 J 5155 ..... **$3.95**



Zinc Spark Gap

For use with spark coil transmitters. Base is molded composition. Metal parts are plated and polished. Can be used with coils up to 4 inches. Shipping weight, 2 pounds.

63 J 5350 ..... **89¢**

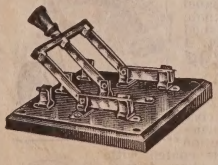


Improved Model Rotary Spark Gaps

Flat, pure copper stationary electrodes and cast aluminum rotary electrodes avoid pitting. Width of break is adjustable. Strong breeze generated by rotary electrode quickly quenches spark, thereby allowing transmission of wave of low decrement. All conducting metal is mounted on formica. Easily handles 40,000 volts without endangering motor windings. Constant, steady speed. Shipping weight, 10 pounds.

Size ½ K. W. 1/20 H. P. Universal motor. For 108 to 115-volt current. Speed, 4000 revolutions per minute.
563 J 5142 ..... **$14.80**

Size 1 K. W. 1/12 H. P. Universal motor. For 108 to 115-volt current. Speed, 5000 revolutions per minute.
563 J 5143 ..... **$16.95**



New Style Antenna Switch

A large, sturdy, well built "change over" switch, suitable for use on sets up to 1 K. W. Mahogany finish base. Improved support, copper blades. Fitted with third blade to disconnect receiver when sending. Our price on this switch shows you a considerable saving. Quick, easy operation. Shipping weight, 3 pounds.

63 J 5114 ..... **$2.48**

Standard Wireless Key

One of the finest keys made for radio work, either spark or C.W. Base lever and supports made of heavy brass in lacquered gold finish. Extra large, durably hardened contact points. New style knob. Shipping weight, 1 pound.

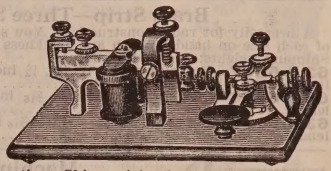
63 J 5352 ..... **$2.89**

Steel Lever Keys

Steel lever and switch strap are heavily nickel plated and buffed. Black composition knobs on switch and key. Shipping weight, 14 ounces.

63 J 1739—Leg key with legs to go through table or desk **$1.73**
63 J 1741—Legless key to screw to top of table or desk .. **1.89**

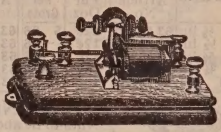
Amateur Telegraph Set



Full size key and sounder, mounted on polished oak base. A good instrument for beginners. Price includes up-to-date Operator's Manual containing Morse code, instructions for telegraphing and other information. Ship. weight, 2⅝ pounds.

63 J 1715—With 4-ohm sounder **$2.65**
63 J 1719—With 20-ohm sounder **2.98**

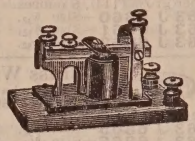
Pony Relay



A relay working in conjunction with each instrument will improve the efficiency of any telegraph system, when several instruments are connected on the same line. Also used on burglar alarm systems. Is finely finished. Made of high grade materials. Resistance, 20 ohms. Shipping weight, 2¼ pounds.

63 J 1745 ..... **$3.10**

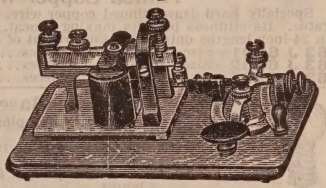
Sounders



Same as used on our professional combination set. Nicely finished and strongly built to give long and accurate service. Shipping weight, 24 ounces.

63 J 1735— 4-ohm sounder .. **$2.30**
63 J 1737—20-ohm sounder .. **2.50**

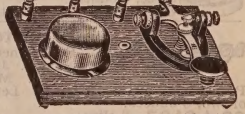
Professional Telegraph Set



Regulation instrument used by professional operators. Sounder and key mounted on polished wood base. Frame of sounder polished brass, with aluminum lever and hard rubber covered magnets. Key polished brass frame with steel lever, hard rubber knob and a circuit breaker. Strongly built throughout. Shipping weight, 3 pounds.

63 J 1730— 4-ohm combination set **$3.78**
63 J 1732—20-ohm combination set **3.98**

Wireless Practice Set



Anyone learning wireless telegraphy transmission must know the code. Send for a wireless practice set and see how easy it is to learn the code. Set consists of a key and buzzer mounted on a polished wood base. Buzzer reproduces accurately the high pitched sounds of wireless code stations. Connect a dry battery to the binding posts on the set by means of a short piece of wire, press the handle of key and a buzzing sound will be produced. In a very short time your ear will become accustomed to the various combinations of dots and dashes representing different letters and numerals. Practice until you can understand the signals at the speed sent by average stations, and you have completed the most difficult part of wireless telegraphy. A very good way to learn the code quickly is to place two of these sets in separate rooms with an operator at each set, and practice sending signals back and forth. Chart included with each set. Base size, 7 by 4¾ inches. Shipping weight, 3 pounds.

63 J 1750 ..... **$1.90**

Learner's Code Chart

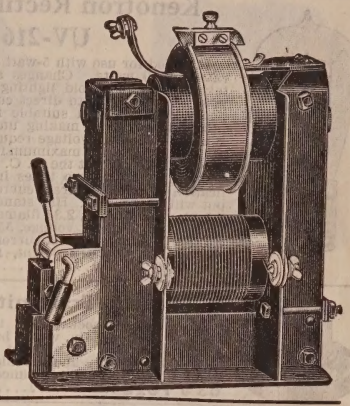
Explains how to learn the code by the sound method, which is recognized as the correct way. With the aid of this chart you can learn the code faster and more thoroughly. A copyrighted system that gives fast, sure results. Printed on durable celluloid in convenient pocket size. Shipping weight, 2 ounces.

63 J 1751 ..... **48¢**

Thordarson Type R Transformers

For use on 108 to 115-volt 60-cycle alternating current. Provided with adjustable magnetic leakage gap which controls primary input, giving a wide range of amperage and permitting easy adjustment. No impedance or choke coil necessary in primary circuit. This transformer has some wonderful long distance records and has given general satisfaction to amateurs for years. Works best when used with rotary spark gap producing about 800 sparks per second. Shipping weights: 35 and 55 pounds.

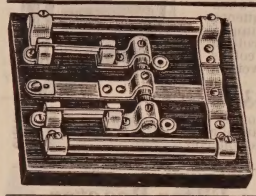
Article Number	K.V.A.	Amperage	Sec. Volts	Each
563 J 630	½	1 to 6	10,000	**$18.90**
563 J 632	1	2½ to 14	25,000	**34.20**



Thordarson Type RS Transformers

This type differs from the well known model shown above, in that it does not have the adjustable magnetic shunt. All other features of sturdy, compact construction and correct electrical characteristics are the same. For use on 105 to 120-volt 60-cycle alternating current.

Article Number	K.V.A	Sec. Volts	Shipping Weight	Each
563 J 633	¼	8,000	15 pounds	**$ 9.00**
563 J 635	1	25,000	35 pounds	**25.65**

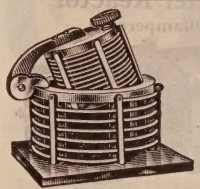


Kick Back Preventer

Mahogany Finished Base

Prevents high frequency surges from discharging back into power line. A necessity when power transformer is supplied from city mains. Two 1000-ohm resistance rods. Mahogany finished base. Connections are of strip copper. Shipping weight, 4 pounds.

63 J 5358.....**$3.80**



Commercial Type Oscillation Transformer

Designed to give wave ranges both above and below 200 meters. Solid copper windings on formica supports 10½ inches diameter, primary of six turns No. 3 wire. Secondary is 6½ inches diameter of twelve turns No. 5 wire. Mahogany finished woodwork. Two helix clips included. Shipping weight, 26 pounds.

563 J 648.....**$14.95**

Variable Transmitting Condenser

Oil Immersed

An oil immersed variable condenser for use with all makes of transformers up to 1 K.W., 25,000 volts. Phenol fiber dielectric, corrugated aluminum separators allow circulation of oil, which is very effective in keeping down heating. Flat aluminum sheet electrodes with rounded corners. Variable in ten steps of .0009 MF each from .0018 MF to .009 MF. Especially designed to prevent corona losses and brush discharge. Carefully made to give long and exacting service. Oil included. Shipping weight, 35 pounds.

563 J 620.....**$22.75**

Radio Hand Microphone

Portable handset used when transmitting speech over radio telephone. Being especially designed for radio purposes, it has a properly designed element of correct resistance and current carrying capacity for most efficient results. Fitted with 6-foot cord for connection to modulator circuit, permitting the operator to move about while transmitting. Exposed metal parts nickel plated and polished. Black corrugated handle. Hook for hanging up. Shipping weight, 2 pounds.

63 J 7011.....**$6.48**

Panel Mount Radio Microphone Set

Mounts firmly on panel, has adjustable enameled pony arm with polished nickel finish microphone. Same high grade construction as above handset. Shipping weight, 2 pounds.

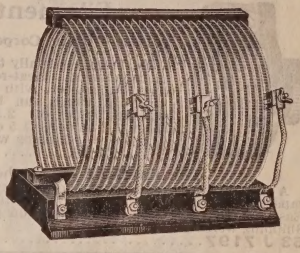
63 J 7012.....**$4.68**

Radio Corporation Catalogue

This is a book listing all of the Radio Corporation products, which are described fully and completely. In addition it contains a very comprehensive treatise on C.W. transmission and other information useful to the radio enthusiast. Also, there are shown a number of transmitting and receiving circuits, wiring diagrams and a list of the apparatus required. Shipping weight, 6 ounces.

63 J 7072.....**35¢**

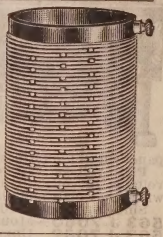
Oscillation Transformer Radio Corporation UL-1008



This transformer is designed especially for use in tube transmitting circuits. It is also adaptable for use as an auto transformer of spark set oscillation circuits. Consists of 25 turns of nickel plated copper strips with rounded edges. Offers very little resistance to radio frequency currents, thereby assuring maximum radiation output of low power C.W. transmitters. Securely mounted on wood base which has four binding post connections, three of which have flexible conductors and clips for selecting pick-off points on the coil. The clips are easily attached or removed from coil, but when wing nut is tightened they will positively hold their positions and can not be accidentally moved or detached. All metal parts nickel plated. Polished, black finished base. Size, 7⅞ by 6¼ by 9⅜ inches. Shipping weight, 7 pounds.

563 J 7035.....**$9.00**

Acme C. W. Inductance



A rugged, flexible and efficient C.W. inductance. Consists of 30 turns of No. 12 B. & S. copper wire, wound on a 5-inch slotted bakelite tube. Taps are brought out at each turn in the form of studs rigidly fastened to the wire and held in place by means of bakelite strips. Five insulated terminals for fastening to connecting wires are supplied. These make a rigid, positive radio frequency contact. Five separate connections may be made on the inductance, each one capable of being varied one turn at a time while the tubes are excited and in operation. Shipping weight, 4 pounds.

563 J 7037.....**$7.48**

Acme Grid Coils

For use in circuits which require a grid coil. Consists of 25 turns of wire wound on a 4-inch bakelite tube. Tapped at fifteenth turn, making three variations possible; namely, 10, 15 and 25 turns. Fits inside of the Acme C.W. Inductance shown above. Shipping weight, 2 pounds.

63 J 7050.....**$1.86**

Tuska Molded C. W. Inductance

A high quality, efficiently designed article at an exceptionally low price. Wound on molded bakelite tubes 4 inches in diameter and 6 inches long; 42 turns of bare copper wire wound in molded threads. Carrying capacity, 50 watts. Shipping weight, each, 2 pounds.

63 J 7041—Wound and tapped at every third turn.....**$3.37**

63 J 7043—Wound and tapped at every turn.....**3.88**

63 J 7045—Tube only, threaded but not wound. Shipping weight, 1½ pounds...**1.95**

Transmitting Grid Leak

Radio Corp. UP-1718

Necessary in tube transmitting circuits. Shunted across grid condensers of oscillating tubes, they limit the potential accumulated on the grid of the tube and thus govern the output to the antenna and also the character of the antenna oscillations. Resistance element is imbedded in a heat-resisting tube that will withstand sudden and extreme temperature changes. Metal terminals for firm connections. Resistance, 5000 ohms with mid-tap at 2500 ohms. For use with 5-watt transmitting tubes. Size, ½ by 5 inches. Shipping weight, 1 pound.

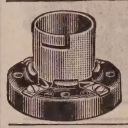
63 J 7024.....**$1.10**

Kenotron Rectifier Tube UV-216

Intended for use with 5-watt power tubes and is rated at 20 watts. Changes alternating current taken from household lighting circuit through a power transformer to direct current. This rectified current is then suitable for either plate or filament operation, making unnecessary a motor generator for high voltage required by plate. The output energy is at a maximum for these tubes when the load is such that the D. C. is between 350 and 400 volts. Using two tubes in a full wave rectification circuit, the direct current and watts output will be doubled. Has standard 4-prong base, 7.5 filament voltage, 2.35 filament current. Alternating current input voltage, 550 volts (stepped up from 110 voltage). Direct current output, 20 watts, 350 volts. Shipping weight, 1 pound.

63 J 7020 ..... **$7.50**

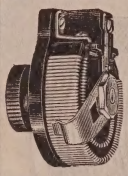
Porcelain Transmitting Socket



The proper socket for transmitting tubes. Base is of porcelain, which is the ideal material for this purpose on account of its low specific inductive capacity and its high insulating qualities. Shipping weight, 8 ounces.

63 J 7022 ..... **89¢**

Filament Rheostat



Radio Corporation PR-535

Designed especially to regulate power tube filament current. Heat-resisting molded base 2½ inches diameter, with two concentric resistance windings which can be arranged to give four separate values of: 2.5 ohms, 1.2 amperes; 3.5 ohms, 1.2 amperes; 1.5 ohms, 2.5 amperes; 6 ohms, ½ ampere. Shipping weight, 1 pound.

63 J 7198 ..... **$3.00**

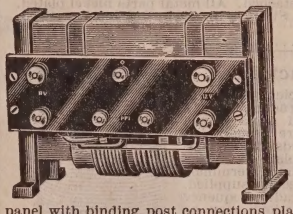
Our Special Power Tube Rheostat

A well designed, well made, moderately priced rheostat; 5-ampere capacity, 1½ ohms resistance. Base will stand heat up to 600° F. Easy connections. Can be mounted on panels up to ⅜ inch thick. Shipping weight, ½ pound.

63 J 7197 ..... **95¢**

Acme C. W. Power Transformers

Combined Plate and Filament



75-Watt Output Capacity

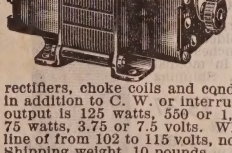
High voltage current—obtained from these transformers when passed through the proper combination of rectifiers, choke coils and condensers—is applied to the plate as a direct current and is suitable for both radio telephony and telegraphy. Low voltage current is applied to the filament without rectification. Mounted type is securely mounted on standards and all connections are brought out to a formica panel with binding post connections plainly marked.

Plate voltage, 375 volts; plate current, 100 milliamperes; filament voltage, 10 volts; filament current, 5 amperes. These transformers will supply plate and filament voltages and current for two 5-watt tubes. Shipping weights: 10 and 8 pounds

563 J 7060—Mounted. **$12.00**

563 J 7062—Unmounted, core and coils assembled. **10.00**

Radio Corporation Power Transformer UP-1368



Maximum Input, 325 Watts

This transformer connected to alternating current 102 to 115 volts, 50 to 60 cycles, will deliver proper voltages and current for plate and filament of Radiotron UV-202, 5-watt transmitting tubes. As many as four tubes can be handled, and the current produced when passed through proper combinations of rectifiers, choke coils and condensers is suitable for radio telephony in addition to C. W. or interrupted C. W. telegraphy. Plate winding output is 125 watts, 550 or 1,100 volts. Filament winding output, 75 watts, 3.75 or 7.5 volts. When transformer is connected to power line of from 102 to 115 volts, no filament rheostat is necessary. Shipping weight, 10 pounds.

563 J 7070 ..... **$20.00**

Thordarson Special Transformer

Designed to handle one 5-watt tube. Wiring diagrams are supplied with each transformer, which shows how some very remarkable results can be obtained on either C. W. telephony or telegraphy. For stations where a range of only 10 to 15 miles is required, this transformer with the other necessary accessories can be built into a very efficient set at a low cost. Plate voltage, 650 volts; filament voltage, 10 volts. Built shell type unmounted only. Shipping weight, 5 pounds.

563 J 7075 ..... **$6.25**

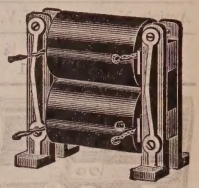
5-Watt Transmitting Tube Radiotron UV-202

This tube is especially intended for low power radio telephone and C. W. telegraph sets. Two 5-watt tubes in parallel will put about 1.5 amperes into the average amateur aerial using one tube as modulator and one tube as oscillator. Radiophone range of forty miles is obtainable and four times that distance for C. W. telegraph when the two tubes are connected in parallel. Four or five 5-watt tubes can be worked in parallel with increased range. These tubes can be operated on either alternating or direct current. They may also be used as power amplifiers in radio receiving circuits. The voltage amplification obtained from them is particularly useful for the operation of loud speakers. Has 4-prong base. Filament voltage, 7.5 volts; filament current, 2.35 amperes; plate voltage, 350 volts normal; plate current, .045 ampere. Watts output, 5 watts normal. Shipping weight, 1 pound.

63 J 7015 ..... **$8.00**

Acme Choke Coils

1½ Henries



Choke coils are used to smooth out the pulsations in the direct current supply to keep a constant potential current when modulating. Also prevent high frequency from backing up in the power supply. Best results are obtained with a coil in each side of the line. The double coil is used for this purpose. Shipping weight, each, 3 pounds.

63 J 7101—150 MA capacity, single coil **$3.70**

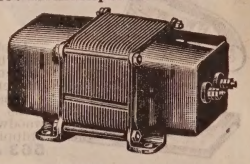
63 J 7102—150 MA capacity, double coil **$5.68**

63 J 7103—500 MA capacity, single coil **5.68**

63 J 7104—500 MA capacity, double coil **7.65**

Radio Corporation Filter Reactor

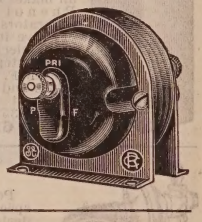
Mounted UP-1626—160 Milliamperes



This reactor is used to smooth out the high voltage current supplied to the plate circuit of a transmitting tube. Previous practice has been to supply a relatively small inductance unit for this purpose with a group of large capacity condensers. It is more economical, however, to provide a large inductance unit and a relatively small capacity condenser. This reactor was specially developed with this fact in mind. Will operate with any circuit employing from one to five power tubes. Shipping weight, 10 pounds.

563 J 7105 ..... **$9.00**

Radio Corporation Plate Circuit Reactor UP-415



Radio telephone circuits using one or more tubes as oscillators and one or more additional tubes as modulators, require a reactor in series to the plate circuit to maintain the direct current supply voltage to the plate at constant value. Has an inductance of one henry at audio frequencies. Direct current resistance, approximately 64 ohms. Shipping weight, 1½ pounds.

63 J 7110 ..... **$4.75**

Filter Condensers

For smoothing out high voltage current from direct current generators or step-up transformers. Improves telephone or C. W. signals. Carefully made. Mounted in flat metal cases, size 4¾ by 5¼ by 1 13/16 inches. Connecting leads at end of case. Shipping weight, each, 1 pound.

63 J 7115—750-volt. 0.5 MFD Capacity, ... **$1.25**

63 J 7116—750-volt. 1.0 MFD Capacity, ... **2.00**

Condensers for C. W. Transmitter Set

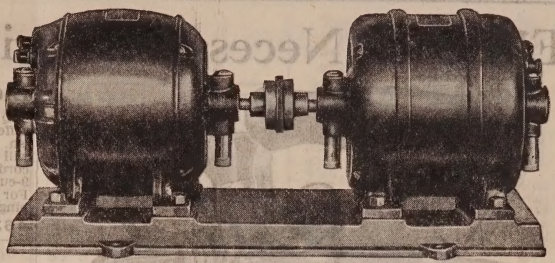
63 J 7125—Faradon type UC-1014. Capacity, .002 MFD.; voltage, 3000 volts. Used as a grid condenser, radio frequency bypass condenser or blocking condenser. Shipping weight, 8 ounces. **$2.25**

63 J 7126—Faradon type UC-1015. Rated at 7500 volts; 3 capacities: .0003, .0004, .0005 MFD. Used as a series antenna condenser or an intermediate circuit condenser. Shipping weight, 8 ounces **$5.00**

63 J 7127—Faradon type UC-1803. Rated at 10,000 volts. Capacity, .00005 MFD. Intended to be used as a blocking or coupling condenser. Shipping weight, 10 pounds **$4.50**

Radio Motor Generators

These motor generators are especially designed to supply plate circuit current for transmitting tubes. Connect them up with any power circuit and they deliver current of the proper voltage and amperage. Very rugged four bearing construction and will deliver rated capacities on continuous run. The motor supplied is for standard 110-volt 60-cycle alternating current, but sets with motor for any current can be made to order. Write for special information.



Article Number	Voltage Output	Watts Output	Will Handle Tubes	Shipping Weight	Each
163 J 696	300	15	One 5-Watt	20 lbs.	$29.50
163 J 697	350	40	Two 5-Watt	41 lbs.	48.00
163 J 698	500	150	Six 5-Watt	100 lbs.	75.00
163 J 699	1000	250	Two 50-Watt	105 lbs.	95.00

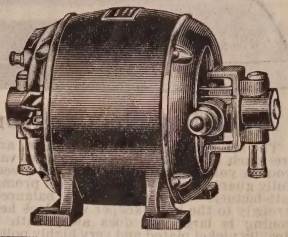
The Radio Dynamotor

To Operate from 32-Volt Direct Current

This combination dynamo and motor operates from 32-volt farm electric plant or motorboat plant current. Connect the motor to the 32-volt current and the generator produces 500 volts, 75 watts, which will take care of four tubes, two oscillators and two modulators. This generator with the other proper accessories can be built up into a transmitting set having a radiophone range of 50 miles and upward. Shipping weight, 45 pounds.

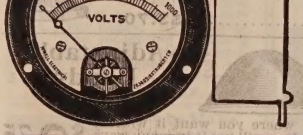
163 J 688 ..... **$60.00**

6-Volt Radio Dynamotor



Will operate on a 6-volt storage battery. The proper machine for a portable set. Can be used on automobile, in motorboat, or in the station. Entirely enclosed. Very rugged and durable. Delivers 350 volts, 15 watts. Will handle one 5-watt tube nicely. Net weight, 18 pounds. Shipping weight, 30 pounds.

163 J 689 ..... **$35.00**



Jewell Radio Meters

These meters are made by the Jewell Electrical Instrument Company. They are high quality instruments that have proven very satisfactory for radio work. Are very ruggedly built. Genuine sapphire bearings. Can be mounted flush on panel. Two sizes of instruments are supplied. We carry in stock and can make prompt shipment on meters with the calibrations more commonly used. We can also supply meters of any other calibrations within approximately 10 days after receipt of order. All meters have black enameled flanges with white faces and accurate hand drawn scales. Shipping weights, each, 1½ to 3 pounds.

Direct Current Ammeters

Pattern 54

Flange diameter, 3¾ inches; case diameter, 3 inches. **$6.95**

63 J 7140—0-1½ amperes 6.95
63 J 7141—0-5 amperes 6.95

Pattern 33

Flange diameter, 3¼ inches; case diameter, 2½ inches. **$5.40**

63 J 7145—0-1½ amperes 5.40
63 J 7146—0-5 amperes 5.40

Radio Frequency Ammeter—Pattern 64

An antenna radio frequency ammeter is a necessity to properly control the operation of a C. W. tube set. These meters are of the thermo-coupled type, which makes a very high class instrument. Indicate current radiated very accurately even after long usage.

Flange diam., 3¾ inches; case diam., 3¼ inches. **$11.25**

63 J 7180—0-1½ amperes 11.25
63 J 7181—0-3 amperes 11.25
63 J 7182—0-5 amperes 11.25
63 J 7183—0-10 amperes 11.25

Direct Current Milliampere Meters

Pattern 54. Flange diam., 3¾ in.; case diam., 3 in. **$6.95**

63 J 7150—0-10 milliamperes 6.95
63 J 7151—0-30 milliamperes 6.95
63 J 7152—0-300 milliamperes 6.95
63 J 7153—0-500 milliamperes 6.95

Pattern 33. Flange diam., 3¼ in.; case diam., 2½ in. **$5.40**

63 J 7155—0-10 milliamperes 5.40
63 J 7156—0-30 milliamperes 5.40
63 J 7157—0-300 milliamperes 5.40
63 J 7158—0-500 milliamperes 5.40

Direct Current Voltmeters

Pattern 54. Flange diam., 3¾ in.; case diam., 3 in. **$7.10**

63 J 7160—0-10 volts $6.95
63 J 7161—0-15 volts 6.95
63 J 7162—0-30 volts 6.95
63 J 7163—0-50 volts 6.95
63 J 7164—0-125 volts .. 13.95
63 J 7165—0-500 volts .. 13.95
63 J 7166—0-1000 volts .. 19.95

Pattern 33. Flange diam., 3¼ in.; case diam., 2½ in. **$6.95**

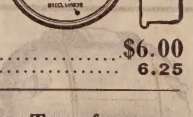
63 J 7170—0-10 volts $5.40
63 J 7171—0-15 volts 5.40
63 J 7172—0-30 volts 5.40
63 J 7173—0-50 volts 5.40
63 J 7174—0-125 volts .. 13.20
63 J 7175—0-500 volts .. 13.20
63 J 7176—0-1000 volts .. 20.50

Alternating Current Voltmeters and Ammeters

Pattern 74. Very accurate, steady readings. Flange diameter, 3¾ inches; case diameter, 3¼ inches. **$7.20**

63 J 7185—0-5 amperes 7.20
63 J 7190—0-10 volts 7.20
63 J 7191—0-15 volts 7.20

Antenna Ammeters
Radio Corporation UM-530 and UM-532



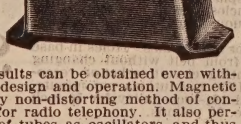
These ammeters are of the hot wire type. They are fairly accurate and will remain so through a long period of use. Sensitive to slight current variations. These meters are not as accurate nor durable as the thermo-coupled type listed above. Provided with special pointer adjustment. Mount on front of panel. Diameter, 2½ inches; thickness, ¾ inch. Provided with ¾-inch long studs. Shipping weight, 1 pound.

$6.00

63 J 7186—0-2.5 amperes 6.00
63 J 7187—0-5.0 amperes 6.25

Magnetic Modulators for Radio Telephony

Radio Corporation UT-1643 and UT-1357



These modulators work on the same principle as those used in high powered transmitting stations. Once connected to a radio telephone they require no further adjustment or attention. Best of results can be obtained even without previous experience. Simple in design and operation. Magnetic modulation is claimed to be the only non-distorting method of controlling the output of a single tube for radio telephony. It also permits the parallel use of a number of tubes as oscillators, and thus eliminates the use of special modulator tubes with their necessary additional accessories and critical adjustments. Shipping weights, 2 and 3 pounds.

63 J 7205—UT-1643, ½ to 1½ amperes ..... $ 8.50
63 J 7206—UT-1357, 1½ to 3½ amperes 10.00

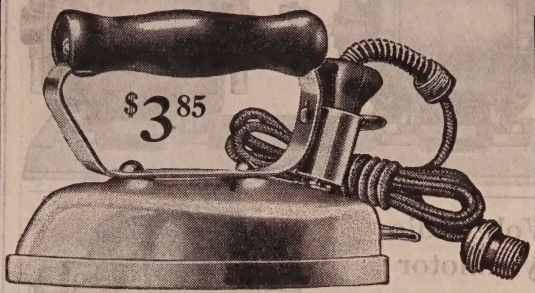
Microphone Transformer

Radio Corporation UP-414

The characteristics of this transformer are such that with a suitable microphone and a battery of four dry cells connected in series with the primary coil, a secondary voltage is obtained which will provide effective control of the radiated energy. Also provided with a side tone winding which may be connected to the telephone of a receiving set while transmitting, thus enabling the operator to check the operation of his microphone. Shipping weight, 1½ pounds.

63 J 7212 ..... **$7.25**

Electrical Necessities—Priced to Save You Money!



A Quality Electric Iron at a Low Price

The special low prices at which we are offering these Electric Irons are much below their present market value. You will recommend this iron to your friends after you have seen the splendid work it does. Fully guaranteed. We will replace promptly any irons which prove unsatisfactory. They are perfectly balanced—a feature which will appeal strongly to the housekeeper who does her own ironing, especially if the ironing is large. It does away with unnecessary, tiresome strain. Heavily nickel plated and very highly polished. Excellent quality heating parts. Complete with stand, six-foot attaching cord and plug. Net weight, 6 pounds—the most effective and convenient weight, as has been proved by the experience of thousands of women. For use on 105 to 120-volt current. Especially priced to save you money. Shipping weight, complete, 8 pounds.

63 J 1801—Complete.....**$3.85**

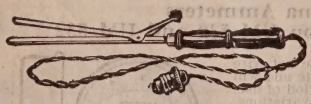
Electric Grill Stove

$4.78

Boils, broils, fries, toasts and cooks. Set it right on your fine dining room table and see your food prepared. Makes four slices crisp, brown toast at one time. Handy for making coffee or tea. Broils steaks and chops deliciously. Fries ham or eggs quickly. Two pans with ebonized handles make it a Stove of wide utility. Neat, graceful appearance. Beautifully polished nickel finish. Guaranteed to give long, satisfactory service. Top size, 6⅜ by 5⅜ inches. Height, 4 inches. Use it for preparing breakfast, luncheon or any meal requiring only one burner. This stove is made by one of the largest manufacturers in this country, and will give you many years of continuous service. Fitted with 6-foot cord and separable attaching plug. An excellent value at our price. Uses 500 watts current. Attach to any 100 to 120-volt lighting socket or outlet. Shipping weight, complete, 3 pounds.

63 J 1841—Complete.....**$4.78**

Electric Curling Iron



$2.25

Quickly puts a beautiful wave or curl in your hair without fuss or bother. Shield is not detachable; 5/16-inch rod. Metal parts nickel plated. Heating parts guaranteed. Six-foot cord and plug. For 105 to 115-volt current. Ship. wt., complete, 2 pounds.

63 J 1895—Complete.....**$2.25**

Electric Coffee Percolator

Quickly makes delicious coffee. Highly polished finish. Ebonized wood handle will not heat. With 6-foot cord and attaching plug. 9-cup size. Uses 450 watts. For use on 108 to 120-volt current. Shipping weight, complete, 3½ pounds.

$6.60

463 J 712—Complete.....**$6.60**

Flat Top Toaster

$1.48

Toasts bread, cooks, fries and boils; pops corn, toasts marshmallows. Top, 6 inches square. Metal parts nickel, satin finished. Complete with 6-foot cord and plug. For 110 volts. Uses 500 watts current. Shipping weight, complete, 2 pounds.

63 J 1857—Complete.....**$1.48**

Electric Boudoir Lamp

A very attractive Boudoir Lamp at a very low price. Neat and simple in design. Metal parts in old ivory finish, a pleasing contrast with the rose colored, silk-lined shade.

A pair of these lamps makes an acceptable gift for any occasion. A lamp of this type greatly improves the appearance of the boudoir. This is a durable lamp, nothing to break. Height, 12 inches. Wired with push button socket and six feet of cord. Bulb not included. Shipping weight, 4 pounds.

$3.70

63 J 8696.....**$3.70**

Adjustable Handy Lamp

Puts the light just where you want it without any glare to the eyes. You will use it in many ways every day. For night reading in bed, on the sewing machine or for shaving it is almost indispensable.

Every home, office or shop can use one or more of these handy Lamps. This is a lamp of superb quality, it is far superior in value and durability to the many cheaper imitations offered. Heavy cast metal base. Flexible arm adjustable to any position. Metal reflector shade. Key socket; 7-foot cord with plug for attaching to any convenient lamp socket. Height as illustrated, 12 inches. Felt pads on on base. Bulb not included. Shipping weight, 3 pounds.

$2.75

63 J 8619—Statuary Bronze Finish.....**$2.75**

63 J 8620—Verde Green Finish.....**$2.75**

Electric Table Lamp

Proper lighting makes the home more pleasant. Order this lamp today and make your home happier

A simple and beautiful Portable Table Lamp. Shade of six amber-ivory blended art glass panels, overlaid with metal scroll in leaf design. Neat cast metal base in bronze and gold finish. Diameter of shade, 14 inches. Height of lamp, 21 inches. One pull chain socket, six-foot silk cord and attaching plug. No bulbs included. Shipping weight, 40 pounds.

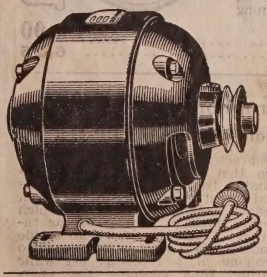
$11.50

563 J 8698.....**$11.50**

Special-Splash Proof Motor

110 Volt-60 Cycle

¼ H.P.



This is one of the greatest values we have ever been able to offer our customers. This sturdy Motor is intended especially for driving churns, operating separators, pumps, washing machines, or for any other work requiring not over ¼ horse power. An ordinary motor would be damaged by liquids splashed onto it—this one is splashproof! The ends are entirely enclosed except for ventilators which prevent overheating on a continuous run. Shaft is ½-inch in diameter and is made of special steel. Large size, bronze bearings oiled from self closing oil cups on motor end frames. Holes in base arranged so slack may be removed from belt without changing location of motor. Attaches to any lighting circuit socket or receptacle of 110 volts, 60 cycles. Speed, 1750 revolutions per minute. Fitted with 10-foot cord and plug, and 1¾-inch pulley for ⅜-inch round belt. Shipping weight, complete, 39 pounds.

$17.95

463 J 200—Complete.....**$17.95**

All Merchandise Shown on This Page Shipped from Portland, Ore.

Newest Books on Radio Telephony and Telegraphy

Radio Book for Amateurs
By A. Hyatt Verrill

It gives a history of radio, describes instruments and accessories, tells of their functions and construction, how to operate the n., what they cost, and what may be expected of them. An up-to-date, concise, simply written book. 170 diagrams. Cloth bound. Size, 5½ by 8 inches.
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Radio Hook-ups
By M. B. Sleeper

This book is indispensable to the radio amateur who desires to build his own receiving apparatus, or to the radio experimenter. Starts with the simple crystal detector and works up. Size, 5¼ by 7¼ inches. Paper bound. 86 diagrams.
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The Wireless Experimenter's Manual
By E. E. Bucher

Touches every basic principle of wireless. Includes tables for computation. Written in simple language that is easy to understand. 340 pages. 300 illustrations. The recognized standard radio text book. Cloth bound. Size, 6¼ by 9¼ inches.
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How to Make Commercial Type Radio Apparatus
By M. B. Sleeper

For the man who builds and designs his own equipment, there is a lot of satisfaction in knowing that his apparatus is comparable to that of commercial design.

This book describes in detail many commercial types of transmitting spark and vacuum tube sets, both telephone and telegraph. 98 illustrations. Paper bound. Size, 5½ by 7½ inches.
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Postage, 8¢ extra

Radio Instruments and Measurements

Tables and formulae from the Bureau of Standards, Department of Commerce, Washington, D. C., that every radio operator and experimenter should have; 330 pages. Size, 5 by 7½ inches. Cloth bound.
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Postage, 8¢ extra

Operation of Wireless Telegraph Apparatus

The operation of wireless apparatus simply explained. International Radio abbreviations; 87 pages. Size, 5 by 7 inches. Paper bound.
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Postage, 4¢ extra

35 Easy Lessons in Radio

A systematic course in the elementary principles, written in simple language; 117 pages, 66 illustrations. Size, 5 by 7 inches. Paper bound.
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Radio for Everybody
By A. C. Lescarboura

Complete description of various kinds of apparatus. Complete guide to practical radio communication. Easily understood and easily applied; 380 pages; 100 illustrations. Bound in cloth.
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Wireless Telegraphy and Telephony
By Alfred P. Morgan

One of the most comprehensive books on this subject. Simply explained. Will enable you to master the details of wireless transmission. Written so anyone can understand it; 154 pages, 156 illustrations. Size, 5 by 7½ inches. Cloth bound.
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Experimental Wireless Stations
By P. E. Edelman

The first and most complete book of the recent important radio improvements, some of which have never before been published. It not only explains how to make equipment, but how to make apparatus to hear all radio telephone and radio telegraph messages.

Vacuum tube circuits, amplifiers, long distance sets, loop, coil, underground receivers, table of wavelengths, capacity, inductance—all presented in detail. 27 chapters; 392 pages; 167 illustrations. Size, 5¼ by 7½ inches. Cloth bound.
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Radio for the Amateur

For him who wishes to construct his own receiving set. Diagrams and drawings; 207 pages. Size, 5 by 7½ inches.
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Construction of Radiophone and Telegraph Receivers for Beginners
By M. B. Sleeper

The man who wants the real thrill of accomplishment builds his own radio apparatus. Radio men can follow the data in this book with confidence. Size, 5¼ by 7½ in. Paper bound.
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By Alfred N. Goldsmith

Transmission and reception of wireless telephony. Illustrated; 247 pages. Size, 6¼ by 9¼ inches. Bound in cloth.
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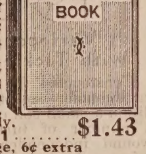
Radio Call Book



All the Radio Calls issued by the Bureau of Commerce; 280 pages, 7 two-color radio maps. Lists every vessel and land station in the world, alphabetically.
57 J 3591 ..... **$1.43**
Postage, 6¢ extra

The Home Radio How to Make and Use It
By A. Hyatt Verrill

Intended particularly for the use of amateurs and those who wish to know how to make use of or adjust wireless telephone instruments. 16 pages of diagrams; 144 pages. Cloth bound. Size, 4½ by 6 inches.
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Design Data for Transmitters and Receivers
By M. B. Sleeper

One of the first books a beginner should buy. Takes up in proper sequence the problems encountered in receiving sets for short, medium and long wave work. Also spark coils, transformers, and vacuum tube transmitters operating on 200 meters. Size, 5 by 7¾ inches; 85 pages. Paper bound.
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Practical Wireless Telegraphy
By E. E. Bucher

Explains wireless transmission and reception of telegraphic code. Includes a series of test questions and hook-ups. 336 pages. Illustrated. Size, 6¼ by 9¼ inches. Cloth bound.
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Vacuum Tubes in Wireless Communication
By E. E. Bucher

It deals with the most vital radio apparatus. Completely describes the vacuum tube and its operation. 202 pages Illustrated. Size, 6¼ by 9¼ inches. Cloth bound.
57 J 3585 ..... **$2.45**
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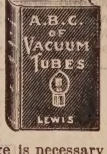
The A B C of Vacuum Tubes Used in Radio Reception



A book for the person who wishes to know what goes on inside a vacuum tube when used in a radio receiving circuit. No previous technical knowledge is necessary to understand it. Illustrated. Cloth bound. Size, 5 by 7½ inches.
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Practical Amateur Wireless Stations
Compiled by the Editor of the Wireless Age

How to build up your station is clearly explained. Shows how the wireless apparatus operates. Full information for the amateur; 136 pages. Size, 6 by 9 inches. Paper bound.
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Wireless Construction and Installation

A practical handbook for the construction and operation of boys' wireless outfits. The young experimenter will find this a valuable book. Size, 5 by 7 inches; 74 pages. Paper cover. 67 illustrations.
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How to Conduct a Radio Club
By E. E. Bucher

Parliamentary procedure, indoor and outdoor experiments and 5000 mile receiving set. Size, 6¾ by 9¾ inches; 148 pages, fully illustrated. Paper cover.
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Postage, 8¢ extra

Experimental Wireless Construction

Detailed instructions for building, installing and operating amateur wireless telegraph apparatus.

A companion volume of the book, "Wireless Construction and Installation for Beginners." Has 86 pages; 93 illustrations. Paper cover. Size, 5 by 7 inches.
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How to Pass the U. S. Government Wireless License Examinations

For the young man going in for professional wireless operation. 142 government examination questions answered; 95 pages. Size, 6¾ by 9½ inches. Paper bound.
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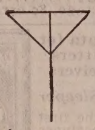
Become Familiar with Radio Terms

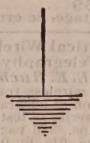
IN this catalogue and in magazines there are many articles on radio in which technical terms are used and many diagrams showing hookups, using terms and characters which are not generally understood. So that you may more clearly understand the articles written and the diagrams, we have prepared a glossary of the terms most commonly used.

With each word description we show the character used in designating the article referred to in the diagram. If you see a term in an article which you do not understand, refer to this page for an explanation. A study of the characters shown on this page will give you enough information so you can easily read a radio diagram.



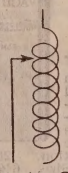
Antenna

That part of the radio apparatus consisting of one or more wires usually suspended out of doors above surrounding objects, for the transmission and reception of radio signals.



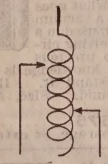
Ground

Any good earth connection such as waterpipe, iron well pump, or metal plates buried in the ground.



Single Slide Tuning Coil

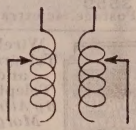
A number of turns of wire wound on a non-magnetic core, with a sliding contact, which will cut in or out any number of turns of wire desired.



Two Slide Tuning Coil

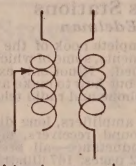
Constructed the same as a single slide tuning coil, but has two sliding contacts and operates in the same nanner as the single slide tuning coil.

The books shown on Page 45 have been carefully selected and are recognized as the best obtainable on the subject of radio. With their help you can obtain an expert knowledge of this wonderful science.



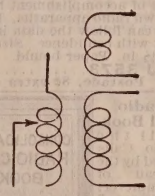
Loose Coupler

Often called receiving oscillation transformer. A primary wound on a non-magnetic core, controlled by taps or a slider contact and connected in the antenna circuit. The secondary also wound on a non-magnetic core, which slides in and out of the primary coil, is controlled by taps and a switch lever and connected in detector circuit.



Variocoupler

A primary wound on a non-magnetic core, usually tapped and controlled by a switch lever, with a fixed secondary wound on a ball shaped rotor inside the primary.

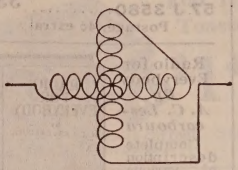


Variocoupler with Tickler Coil

Constructed the same as a variocoupler, except has in addition a small coil consisting of a number of turns of wire wound independently on the primary in inductive relation to the secondary.

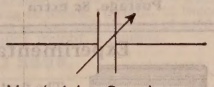
Honeycomb Coils

Inductance coils wound very compact in a manner that practically eliminates capacity effects. Honeycomb coils are of various values and are used mostly as receiving circuit inductances.



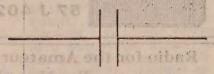
Variometer

A tuning device consisting of a fixed outer winding and a movable inner winding on a non-magnetic ball shaped core. The coils are connected in series.



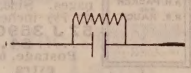
Variable Condenser

A device consisting of two sets of metal plates, one set fixed and one set movable. Its capacity can be changed by varying the relation of the plates to one another.



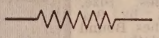
Fixed Condenser

A condenser having a fixed capacity and is not adjustable.



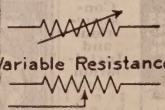
Grid leak and Condenser

A fixed condenser with a high resistance connected in parallel.



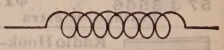
Resistance Coil

A number of turns of resistance wire of fixed value wound on a non-magnetic core.



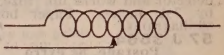
Variable Resistance

A number of turns of resistance wire wound on a non-magnetic core, the resistance being controlled by a sliding contact or by taps and a switch lever. The ordinary vacuum tube rheostat is usually indicated by the lower diagram.

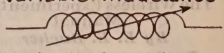


Inductance Coil

A number of turns of wire, whose value is fixed, wound on a non-magnetic core. Often used as a loading coil in the antenna circuit, and also for regenerative purposes in the detector circuit.

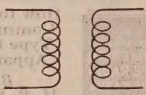


Variable Inductance



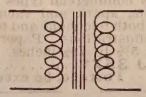
Variable Inductance

A number of turns of wire wound on a non-magnetic core. The value of this coil is variable and is controlled by taps and a switch lever or by a slider contact.



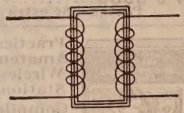
Air Core Transformer

A device for amplifying radio signals, consisting of a primary and secondary wound on a non-magnetic or air core.



Open Core Transformer

A device for amplifying radio signals. Is used also for transmitting purposes. Consists of a primary and secondary wound on a single iron core. The core is free at each end. Can be used for stepping up or down voltage of alternating or pulsating direct current.

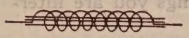


Closed Core Transformer

Consists of a primary and secondary wound on iron cores. These windings are in close relation to each other, and their cores are metallically connected, usually in the form of a square or a circle. This transformer is used to amplify audio frequency signals, also in radio telegraph transmitting outfits.

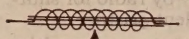
Study These Diagrams and Definitions

THE making of radio sets is an interesting study and hobby. The knowledge obtained through making your own set will better enable you to understand the working of the outfit and will simplify for you many seemingly complex pieces of apparatus and their workings. A few minutes study of the diagrams and definitions given on these two pages will greatly assist you in understanding the various radio descriptions and diagrams. There is no definite accepted standard set of characters used in making radio diagrams, but those shown here are most commonly used. The descriptions given are necessarily brief. For more detailed description and information see books listed on Page 45.

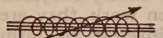


Reactance Coil

A number of turns of wire wound on an iron core which offers resistance to changes of current that are established in it.

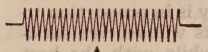


Variable Reactance Coil



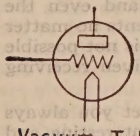
Variable Reactance Coil

Consists of a number of turns of wire wound on an iron core. The resistance to the changes of current usually is governed by a switch lever and taps.



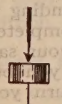
Potentiometer

A unit of high resistance which is variable and is controlled by a sliding lever contact.



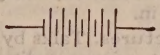
Vacuum Tube Detector or Amplifier

Consists of three elements, a grid, a plate and a filament; and is used to detect and rectify radio signals. Amplifier is constructed in the same manner as the detector and is used to amplify both radio and audio frequency signals. This article is shown in many different ways, but the three elements always are shown grouped together.



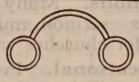
Crystal Detector

Rectifies and detects incoming radio signals. It usually is constructed with a spiral of wire making contact with a sensitive crystal such as silicon, galena or carborundum.



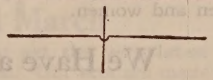
Batteries in series

The polarity usually is marked in the diagram.



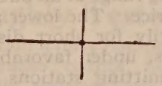
Telephone Receivers

Telephone head set (receivers) usually shown in diagram.



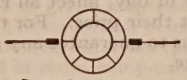
Crossed Wires no Connection

Wires crossing without making contact.



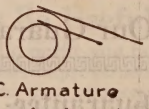
Crossed Wires Connected

Crossed wires making contact.



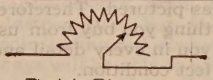
D.C. Armature

Armature for direct current generator.



A.C. Armature

Armature for alternating current generator.

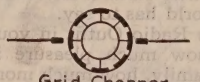


Field Rheostat

Rheostat for controlling field current of D.C. or A.C. generator and D.C. motor.

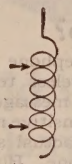
Transmitting Key

Used to interrupt the current in the primary circuit of a telegraph transmitting outfit so as to form dots and dashes.



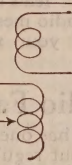
Grid Chopper (Ticker)

A small wheel with segments similar to a D. C. commutator, driven by a motor and used to interrupt the continuous waves of a tube transmitter.



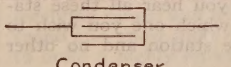
Helix

A variable inductance coil usually constructed with heavy copper or brass wire or hollow tubing. Used in radio transmitting sets.



Oscillation Transformer

Consists of a tapped primary and movable secondary. Can be used for transmitting and receiving. For transmitting purposes it is constructed with heavy copper or brass wire or hollow tubing. The receiving oscillation transformer usually is called a loose coupler or a variocoupler.

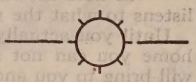


Condenser Adjustable by Steps

Condenser adjustable by steps. For transmitting purposes where one or more condenser units can be cut in or out, such as Leyden jars, large plates or a unit made of tinfoil and wax paper.

Rectifier Tube

Vacuum tube with two elements. Used to rectify or change alternating current into pulsating direct current. Tubes are used in radio transmitting.

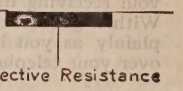


Rotary Spark Gap

Consists of a disc or wheel driven by a motor on the same shaft. From the rim of this disc or wheel a number of lugs project and rotate between two stationary lugs. The primary circuit of the oscillation transformer is interrupted at such a speed that it emits a musical note which can be heard through static.

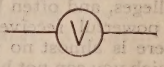
Microphone

A telephone transmitter used in radio telephony.



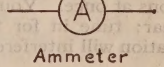
Protective Resistance

A high resistance, usually a graphite rod, which is connected directly across the line and has a ground lead connected to the center.



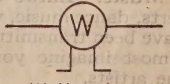
Voltmeter

Records the voltage in a circuit.



Ammeter

Records the amperage or amount of current that is in a circuit.



Wattmeter

Records the amount of electrical energy consumed.

The real pleasure of radio comes when you understand it. The books and instructions we supply will help you get a good working knowledge of all the theories involved.

Radio Makes Life More Interesting

It Brings News—Fun—Education and Endless Entertainment to Every Member of the Family

ALADDIN, rubbing his wonderful lamp, never achieved such marvels or had so much fun as does the radio fan who turns a knob and listens to what the whole world has to say.

Until you actually have a Radio Outfit in your home you can not realize how much pleasure it will bring to you and your family, how much more interesting your home will be, and how much you will learn about your United States.

Radio is simple; that is why it is so popular. It is inexpensive; every home may have an outfit of its own, and it spreads the world before you like an open story book.

What Is Radio?

A radio receiver is a wireless telephone working on the same principle as the wireless telegraph. However, instead of receiving the message in the dot and dash telegraph code, the sensitive receiving instrument reproduces for you the actual sound of the voice, just as does your telephone. But unlike your telephone, these sounds are not transmitted to you along wires; they come through the open air similar to sound waves. The radio waves are picked up by the aerial wires and conducted to your receiving instrument by your "lead in" wire. With a good outfit you can hear radio messages as plainly as you hear the voice of your neighbor over your telephone.

"In the Air" for Radio Fans

Practically every large city now has one or more broadcasting stations which send out regular daily programs. These stations have been established by electrical and radio companies, newspapers, colleges, and often by the cities themselves. With a powerful receiver, no matter where you live there is almost no place in the United States from which you can not hear some of these stations. Even with one of the simpler outfits, if you live near a number of good size cities you may listen in on programs from several broadcasting stations.

This does not mean that you hear all these stations at once. You decide which one you wish to hear; tune in for that one station and no other station will interfere.

Your Radio Outfit Will Bring to You—

Music. Entire operas, musical comedies, concerts, dance music, vocal and instrumental numbers have been transmitted so perfectly that you could almost imagine yourself in the same room with the artists.

Market and Weather Reports. Up to the minute quotations on stocks, bonds and farm products as well as the official weather forecast, are sent out and reach radio fans hours before they appear in the daily papers.

Time. At a definite hour each day the exact time is signaled so that your clocks and watches may be set accurately.

News. Daily bulletins flash state, national and world news, sporting events, play by play, election returns and many other things you are interested in.

Lectures. Talks by well known men and women on art, science, politics, current events, and many other important, interesting subjects, are included in the daily radio programs.

Sermons. Many churches provide entire church services—sermon, music and all—by radio for shut-ins or for churches with no resident pastor.

Educational. Progressive state universities have installed radio transmitting stations and are sending out complete courses on timely subjects. In connection with their extension work, they are furnishing daily talks of special interest to farm men and women.

We Have a Set for You

In this book you will find a Radio Outfit to suit every pocketbook. The one for you to select depends upon what you want to hear and how much you wish to pay. Of course, the sensitiveness or receiving range of an outfit usually is in proportion to the price. The lower priced sets will receive satisfactorily for short distances, while with the best outfits, under favorable conditions, you can hear transmitting stations a thousand miles or more away.

On Page 26 we explain that the strength of the transmitting station, local geographical and weather conditions, the season of the year and even the time of day, affect all radio instruments no matter what their price. For that reason it is not possible for us to guarantee any set for any given receiving range.

However, with a good receiving set you always will be able to pick up something interesting and entertaining.

Our Guarantee Protects You

Guarantee: It is our intention that every article in this book shall be truthfully described and be exactly as pictured. Therefore, we guarantee everything you buy from us to be satisfactory to you in every detail and to reach you in perfect condition.

You take no risk whatever in sending us your order, for unless you are completely satisfied with the goods and with your saving, you may send back anything you buy from us and we will promptly return your money and all transportation charges you have paid.

Montgomery Ward & Co.

Our Outfits Are Easy to Install

Our Simple Directions Are All the Instructions You Need

Our sets are easy to install because they are as simple as successful receiving instruments can be made, and because every part necessary to get a clear, distinct reception is included in the outfit. With each set we send complete directions which give you every bit of information you need to set up, use and enjoy your outfit.

You do not need to know electricity—you do not need previous experience or study. In our instructions each part is fully pictured and described and each connection is plainly marked. Follow these simple directions and you can not go wrong—you can not fail to be pleased and satisfied with the set you buy from us.

We Are In Step with Radio's Rapid March

In our receiving outfits you get the very latest developments in radio reception. Our sets are made from designs tested and approved by some of the foremost radio engineers, and the very newest successful improvements in radio reception are incorporated in the sets listed in this book.

Our Sets Are Thoroughly Tested

In our Chicago House we maintain a fully equipped testing station where many radio outfits have been given rigid tests. Our radio experts have selected for our stock only those instruments which have proven absolutely dependable and worth the prices at which we sell them.

Even after we have selected our stock, each type chosen to be listed in this book is given additional tests, not only in our station, but from various points around Chicago until we have assured ourselves that we are giving you the very best in radio equipment. We are thoroughly satisfied with the results of these tests—that is why we can safely guarantee that you will be well pleased with the set you select.

Your Set Will Always Be Useful

You need never fear that the radio outfit you buy from us will become out of date—that improvements in radio will make it impossible for you to receive messages with the outfit in which you have invested your money.

Of course, there will be improvements, both in transmitting and receiving instruments; but the basic principle upon which radio is founded always will remain the same—you always will be able to use and enjoy your radio outfit as long as you keep it in good condition.

Read Our Books on Radio

The more you learn about radio the more you want to know. On Page 45 are listed good books which will tell you all about this fascinating subject—how to build your own outfits; how to understand the telegraph code and signals; what famous radio engineers are discovering every day about this wonderful science. Read these books; build your own set; be a radio expert.

Build a Radio Set and Explore the Air

"Dad, mother, everybody! Come here and listen. She's working—she's working!"

Glue your ears to the headset, and sure enough, faint and far away you hear z-z-z-zt, z-z-zt. Twist the tuner and the buzzing sound jumps right up next door and becomes da-da-da-dah, da-da-da-dah. You are listening in on a high power wireless station flashing messages across the continent. YOU have made a radio outfit that works.

Of course you are not the first fellow to make a successful radio outfit. Lots of boys have learned how to make them in school, but many more read the good books on radio, listed on Page 45, used their heads and went to work. They are listening to radio entertainment, and even the wireless messages sent by Uncle Sam and the high power commercial stations all over the country.

Radio is simple. You don't have to know all about electricity. And it is inexpensive; you can make the simplest receiver for but a few dollars. With a little more money you can build an outfit with a longer receiving range; and when you have more money to spend and know more about radio, you may be able to build a highly sensitive receiving set with which you can explore the air for thousands of miles in every direction.

Of course, you can buy a radio outfit complete. But to get the most fun out of radio, build your own. No matter what kind of set you decide to construct, you will find every part you need listed in this book. Study radio as you put your set together, learn all you can about it, and then—

MAKE MONEY OUT OF RADIO! Put up outfits for other people; teach others how to build sets, become a radio operator for church or public entertainments, stores or hotels. Learn the official code and become a wireless operator. There are fascinating jobs on land and sea for boys who are good operators.

Experiment with your set. It may be YOU who makes the biggest discovery of the age in radio, and wins fame and fortune. Radio is the coming profession; radio engineers are commanding big salaries, and holding jobs that are brimful of interest and adventure. It is the boys who are playing with radio today who will be the successful radio engineers of tomorrow.

To you parents whose sons want to look into radio, encourage them. It is the safest, cleanest and most profitable game they can play. The many hours and the few dollars they spend in exploring the air are investments in manhood.

It Is Easy to Order Radio Outfits and Supplies from This Catalogue

IN this catalogue we show a complete line of high grade radio outfits and supplies from which you may choose the equipment best suited for use in your home. You may select a complete outfit ready for use; or, if you prefer to construct your own outfit, this catalogue will enable you to order all of the necessary equipment. In either event, you may rest assured that your order will be filled to your complete satisfaction. For your convenience when ordering, we have enclosed with this catalogue an order blank on which to write your order; however, you may use a plain piece of paper if you desire.

How to Order

The first thing you should do when ordering is to give us your correct address and shipping instructions so the merchandise will reach you promptly. Each family should order under one name only, preferably the name of the head of the household. Write your full name and address plainly. Give your postoffice and state; also shipping point if it is different from post office. If you live in town, give street and house number; if you live in the country, give rural route and box number.

Then go through this catalogue, selecting the outfit or equipment you want, and give us the following information:

1. Give article number of each item, quantity desired, name of article, price and other information according to the outfit or equipment you order.

2. State the exact amount of money sent us with your order. Send remittance in the form of a post office money order, bank draft, or personal check. If you send money, be sure to send by ***registered*** mail, securely folded in heavy paper.

3. ***Shipping instructions:*** Be sure to give full shipping information. If you want your order shipped by parcel post or prepaid express, send additional money to pay transportation charges. We will return any balance due you after we have paid shipping charges.

How to Return Goods

Under our unchanging policy of "Satisfaction Guaranteed or Your Money Back," you are at liberty to return any Radio goods which do not fully satisfy you. When goods are returned by parcel post or express, be sure to pack and wrap securely. Write us a letter giving full instructions regarding the changes you want made in your order; and if returned by express, enclose with your letter the receipt given you by the agent at the time you shipped the goods to us.

Scale of Parcel Post Charges

Radio Outfits and Supplies when shipped by mail take parcel post rates. When figuring parcel post charges, consult this scale.

Weight of Package	For Shipments to Our Customers in Portland, Ore. Local Zone	Not Over 150 Miles from Portland, Ore. 1st 2nd	151 to 300 Miles from Portland, Ore. 3rd	301 to 600 Miles from Portland, Ore. 4th	601 to 1000 Miles from Portland, Ore. 5th	1001 to 1400 Miles from Portland, Ore. 6th	1401 to 1800 Miles from Portland, Ore. 7th	Over 1800 Miles from Portland, Ore. 8th
4 oz. to 1 lb.	$0.05	$0.05	$0.06	$0.07	$0.08	$0.09	$0.11	$0.12
2 lbs.	.06	.06	.08	.11	.14	.17	.21	.24
3 lbs.	.06	.07	.10	.15	.20	.25	.31	.36
4 lbs.	.07	.08	.12	.19	.26	.33	.41	.48
5 lbs.	.07	.09	.14	.23	.32	.41	.51	.60
6 lbs.	.08	.10	.16	.27	.38	.49	.61	.72
7 lbs.	.08	.11	.18	.31	.44	.57	.71	.84
8 lbs.	.09	.12	.20	.35	.50	.65	.81	.96
9 lbs.	.09	.13	.22	.39	.56	.73	.91	1.08
10 lbs.	.10	.14	.24	.43	.62	.81	1.01	1.20
11 lbs.	.10	.15	.26	.47	.68	.89	1.11	1.32
12 lbs.	.11	.16	.28	.51	.74	.97	1.21	1.44
13 lbs.	.11	.17	.30	.55	.80	1.05	1.31	1.56
14 lbs.	.12	.18	.32	.59	.86	1.13	1.41	1.68
15 lbs.	.12	.19	.34	.63	.92	1.21	1.51	1.80
16 lbs.	.13	.20	.36	.67	.98	1.29	1.61	1.92
17 lbs.	.13	.21	.38	.71	1.04	1.37	1.71	2.04
18 lbs.	.14	.22	.40	.75	1.10	1.45	1.81	2.16
19 lbs.	.14	.23	.42	.79	1.16	1.53	1.91	2.28
20 lbs.	.15	.24	.44	.83	1.22	1.61	2.01	2.40
21 lbs.	.15	.25	.46	.87	1.28	1.69	2.11	2.52
22 lbs.	.16	.26	.48	.91	1.34	1.77	2.21	2.64
23 lbs.	.16	.27	.50	.95	1.40	1.85	2.31	2.76
24 lbs.	.17	.28	.52	.99	1.46	1.93	2.41	2.88
25 lbs.	.17	.29	.54	1.03	1.52	2.01	2.51	3.00
26 lbs.	.18	.30	.56	1.07	1.58	2.09	2.61	3.12
27 lbs.	.18	.31	.58	1.11	1.64	2.17	2.71	3.24
28 lbs.	.19	.32	.60	1.15	1.70	2.25	2.81	3.36
29 lbs.	.19	.33	.62	1.19	1.76	2.33	2.91	3.48
30 lbs.	.20	.34	.64	1.23	1.82	2.41	3.01	3.60
31 lbs.	.20	.35	.66	1.27	1.88	2.49	3.11	3.72
32 lbs.	.21	.36	.68	1.31	1.94	2.57	3.21	3.84
33 lbs.	.21	.37	.70	1.35	2.00	2.65	3.31	3.96
34 lbs.	.22	.38	.72	1.39	2.06	2.73	3.41	4.08
35 lbs.	.22	.39	.74	1.43	2.12	2.81	3.51	4.20
36 lbs.	.23	.40	.76	1.47	2.18	2.89	3.61	4.32
37 lbs.	.23	.41	.78	1.51	2.24	2.97	3.71	4.44
38 lbs.	.24	.42	.80	1.55	2.30	3.05	3.81	4.56
39 lbs.	.24	.43	.82	1.59	2.36	3.13	3.91	4.68
40 lbs.	.25	.44	.84	1.63	2.42	3.21	4.01	4.80
41 lbs.	.25	.45	.86	1.67	2.48	3.29	4.11	4.92
42 lbs.	.26	.46	.88	1.71	2.54	3.37	4.21	5.04
43 lbs.	.26	.47	.90	1.75	2.60	3.45	4.31	5.16
44 lbs.	.27	.48	.92	1.79	2.66	3.53	4.41	5.28
45 lbs.	.27	.49	.94	1.83	2.72	3.61	4.51	5.40
46 lbs.	.28	.50	.96	1.87	2.78	3.69	4.61	5.52
47 lbs.	.28	.51	.98	1.91	2.84	3.77	4.71	5.64
48 lbs.	.29	.52	1.00	1.95	2.90	3.85	4.81	5.76
49 lbs.	.29	.53	1.02	1.99	2.96	3.93	4.91	5.88
50 lbs.	.30	.54	1.04	2.03	3.02	4.01	5.01	6.00

NOTE: Packages weighing more than 50 pounds can not be shipped by parcel post beyond the 3rd zone. If your shipment weighs more than 50 pounds and you live beyond the 3rd zone, we will ship your order in two packages or more.

Radio outfits equipped with batteries containing acid must be shipped by express, as the postal regulations exclude them from parcel post mail.

This Radio Book is Filled with High Grade Equipment at Prices as Attractive as these

UNLESS the radio equipment you buy will deliver service, it is not a good investment no matter how little you pay for it. And unless you are a radio expert it is difficult to tell whether or not it will deliver service. At most stores, when you buy radio supplies they are yours—you must keep them even though they prove unsatisfactory.

People who buy their radio supplies from Montgomery Ward & Co. have three advantages—they pay less; they buy from a house which has established a reputation for **dependable goods at low prices**—and they are protected from mistakes or disappointment by our guarantee; for if the goods do not prove satisfactory they may be returned at our expense.

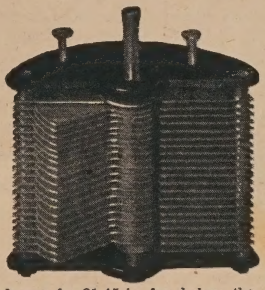
Our stock is complete; our goods have proved satisfactory to thousands of customers, and we sell them at the lowest prices at which **reliable** radio equipment can be sold.

$1.45

11-Plate Variable Condenser

$2.45

43-Plate Condenser



An 11-plate Condenser for $1.45 is far below the price of a few months ago; $1.95 for a 23-plate and $2.45 for a 43-plate are prices which mean great savings to you. A careful selection of the finest variable condensers is shown on Page 22.

$10.95

Whenever you buy a Storage Battery, there is no way for you to tell exactly what you are getting—only the test of time will tell you how good the battery is. You can depend on Ward's quality. No. 563 J 492, 6-volt 40-ampere battery at $10.95 is among the best values to be had.

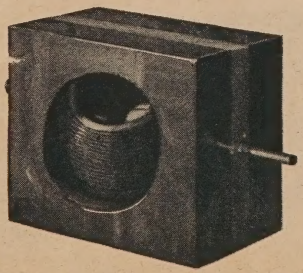
See Page 32

$3.95

Receiver

Our 2,000-ohm, Lakeside Special Receiver, at $3.95, was designed to be sold for $8.00 and is equal to many sets selling at even higher prices.

See Page 19



Vario-meters

$1.95 and **$3.10**

Our Variometers (Page 23) are excellent in design and workmanship. The materials used are the best in their respective classes. Perfect working variometers at $1.95 and $3.10 really are bargains. We offer the finest on the market, with molded rotor and stator forms at proportionate prices.

Genuine Bakelite Sockets

22¢ and 32¢

Higher prices are being asked for inferior sockets. Suitable for use with detector, amplifier and power tubes. Others are listed on Page 30.

$9.75

Loud Speaker

A handsome Loud Speaker Horn, molded of wood fiber, offered for $9.75, which affords a substantial saving. Uses any good brand reproducer, but we recommend the Baldwin type "C" or our Lakeside Special Reproducer.

See Page 18 for Other Loud Speakers

Buy Your Radio Set Complete

Make a Few Simple Connections and You Are Ready to "Listen In"

Radio is bringing music to thousands of lonely homes. Entire operas and musical concerts are being sent over the radiophone to vast audiences, over wide territories. Are you getting your share of Radio Music?

IF YOU are going in for Radio, you want the best equipment your money can buy. You want a dependable receiving outfit which will pick up messages at long range and bring them to you clearly and distinctly. You want either our Airline Special or our Airline De Luxe Complete Receiving Sets, depending on how much you wish to invest in radio.

Either of these sets comes to you complete. All you need do is erect your aerial, make a few simple connections and you are ready to "listen in." Clear, illustrated directions come with each outfit.

We have given both these outfits the most rigid tests, not only in our own testing station, but out in the country, with aerials strung up to flagpoles, windmills, trees—the same conditions under which you will use them. And they have given excellent results in long range receiving.

The Airline Special is a Long Distance Regenerative Audion Detector Receiving Set Complete. Turn to Pages 2 and 3 and read what it has actually done. There is not one of those receiving records that you yourself can not equal or surpass with this outfit.

$49.50 Airline Special

The Airline De Luxe, described on Pages 4 and 5, is a Long Distance Regenerative Audion Detector Receiving Set with a *two stage Amplifier.* It has a longer range than our Airline Special, and will bring in messages many times louder because of the amplifying feature. It is the ideal receiving outfit for home, church or school, and it can be used with a loud speaker, so the sound may be greatly amplified, making it possible for a room full of people to hear the radio programs.

$89.00 Airline De Luxe

For either of these outfits the investment in time and money is small, and the returns in education, information and enjoyment are large.

Montgomery Ward & Co.

Satisfaction Guaranteed or Your Money Back

Chicago, Fort Worth, Kansas City, Portland, Ore., Saint Paul